



PROCEEDING BOOK

19th ASEAN ORL-HNS CONGRESS
in conjunction with
11th INDONESIA ORL-HNS SCIENTIFIC MEETING

Editor :

Soekirman Soekin
Jenny Bashiruddin
Farhat

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Secretariat
RSUP H.ADAM MALIK MEDAN
Bunga Lau Street No.17, 20136 Medan, North Sumatera
Email: official.aseanorlhns-pin2021@gmail.com

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“Come with a New Spirit of ASEAN Solidarity”

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Address :

RSUP H. ADAM MALIK MEDAN

Bunga Lau Street No. 17, 20136 Medan, North Sumatera

Mobile phone: +6281269241921

E-mail: official.aseanorIhnspin2021@gmail.com

Website: <http://aseanorIhns-pin2021.org>

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WELCOME SPEECH CHAIRMAN OF ASEAN ORL-HNS CONGRESS

Proceeding Book of 19th ASEAN ORL-HNS Congress in Conjunction with 11th Indonesian ORL-HNS Scientific Meeting was initiated and organized by ASEAN ORL-HNS Federation. This electronic proceeding aims to provide an opportunity to present and share the latest innovations and results of studies in Otorhinolaryngology-Head and Neck Surgery.

This electronic proceeding's purpose is to provide international sources of information to all ENT specialists and other health professionals who are interested in the science of ORL-HNS in the future. Also, it is expected to improve communication between ORL-HNS doctors so that it has an impact on the development of knowledge regarding and stimulates further education, competency, and equality for ORL-HNS specialists and how roles and activities of ORL-HNS doctors in building communities in Southeast Asia.

Electronic Proceeding of 19th ASEAN ORL-HNS Congress in Conjunction with 11th Indonesian ORL-HNS Scientific Meeting will be reviewed by experts. This proceeding book publishes original research, review articles, and case reports. We are very thankful to everybody within this community who supported the idea of establishing and developing in Proceeding Book of the 19th ASEAN ORL-HNS Congress in Conjunction with the 11th Indonesian ORL-HNS Scientific Meeting. We do hope this proceeding book is useful and acceptable to the readers.

Medan, October 2021

Prof. Dr. dr. Farhat, M.Ked(ORL-HNS), Sp.T.H.T.K.L.(K)
Chairman of ASEAN ORL-HNS Congress



WELCOME SPEECH CHAIRWOMAN OF PERHATI-KL INDONESIA

Assalamu'alaikum Wr Wb

First of all, I would like to congratulate the North Sumatra branch of the PERHATI-KL for working hard to prepare for this event. The 19th ASEAN ORL HNS Congress in Conjunction with the 11th Indonesian ORL-HNS Scientific Meeting was held, hoping that all participants can broaden their horizons, improve competence, and open future research opportunities.

This significant event is one of the efforts to increase the knowledge of PERHATI-KL members of Indonesia, considering that there are still many things that need further discussion and research. There are still many ORL-HNS health problems in Indonesia that require the hard work of all PERHATI-KL members. I hope that this event can discuss current developing knowledge and research opportunities in the future.

Thank you to all speakers and instructors, the committee of The 19th ASEAN ORL-HNS Congress in Conjunction with 11th Indonesian ORL-HNS Scientific Meeting, and all parties who have contributed to organizing this event. This event was successful with the help of many parties. Therefore, we would like to thank the many parties who have helped organize this event.

At this event, research results, reviews, and case reports were presented by researchers. The results of the seminar are then documented in this proceeding. Hopefully this event and proceeding will be useful for readers, both PERHATI-KL members and the health of the Indonesian people.

Prof. Dr. dr. Jenny Bashiruddin, Sp.T.H.T.K.L.(K)
Chairwoman of PERHATI-KL Indonesia
(Indonesian Otorhinolaryngology-Head and Neck Society)



WELCOME SPEECH

PRESIDENT OF ASEAN OTORHINOLARYNGOLOGICAL HEAD AND NECK FEDERATION

Dear all colleagues and friends,

It is an honour to welcome all ASEAN and other countries ORL-HNS specialist on 19th Asean ORL-HNS Congress and 11th Indonesian ORL-HNS Scientific Meeting. This congress is very special for us because we hope will be held on the end of Covid-19 pandemic, where until now the Covid-19 still spread on most countries in the world, by this situation the congress be held by virtual platform.

By the theme "Come with New Spirit of Asean Solidarity" 19th Asean ORL-HNS congress in Conjunction with 11th Indonesian ORL-HNS Scientific Meeting it will bring to a new level ASEAN ORL-HNS cooperation that will provide platform for all ORL-HNS specialist to share the knowledge experience discuss and argument any controversial issues and updated of knowledge and technology for variety ORL-HNS problems. This event became one of the venues for ORL-HNS specialists to present their research, as well as exchange information and deepen research issues, as well as develop sustainable collaboration.

The committee has worked very hard to ensure this event becomes the most memorable ASEAN ORL-HNS event. Not forgetting also to all those who have provided support for the organization of this event and for the preparation of this proceeding. I think as long as ASEAN ORL-HNS Federation Congress this is the first scientific proceeding be edited by the committee. I hope that this proceeding can provide benefits for all parties. Many thank you for all committee had work very professionally.

Finally, the committee would like to apologize profusely for all the shortcomings in organizing this event, starting from the socialization of the activities until the publication of this proceeding.

dr. Soekirman Soekin, Sp.T.H.T.K.L.(K), M.Kes
President of ASEAN Otorhinolaryngological Head and Neck Federation



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TABLE OF CONTENT

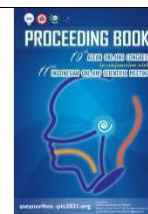
WELCOME SPEECH.....	i
TABLE OF CONTENT.....	iv
 NASAL WASHING DURING ABLATION AS AN EFFORT IN REDUCE NASAL SYMPTOM AND PREVENTING UPPER RESPIRATORY DISEASES <i>Asti Widuri, Rizka Fahriani, Salsa Farida</i>	 01
 CHARACTERISTICS AND BACTERIAL PATTERNS OF NECK ABSCESS IN MOHAMMAD HOESIN GENERAL HOSPITAL PALEMBANG ON JANUARY 2020 TO JUNE 2021 <i>M. Tauhid Lestario, Lisa Apri Yanti</i>	 04
 DIAGNOSIS AND MANAGEMENT OF LARYNGEAL ACTINOMYCOSIS <i>Aji Kusuma, Lisa Apri Yanti</i>	 07
 GENETIC SCREENING FOR CHILDREN WITH HEARING IMPAIRMENT IN SURABAYA SPECIAL SCHOOL <i>Nyilo Purnami, Puguh Setyo Nugroho, Hamam Kusumagani</i>	 11
 THE ROLE OF EARLY RADIOFREQUENCY TURBINATE REDUCTION ON REMODELLING IN PERSISTENT ALLERGIC RHINITIS <i>Nina Irawati, Lisnawati, Diar Riyanti</i>	 13
 THE ROLE OF PLATELET RICH FIBRIN (PRF) FOR WOUND HEALING AND PLASTIC RECONSTRUCTION <i>Mirta Hediayati Reksodiputro</i>	 16
 MEDICATION HISTORY OF MOTHERS WHOSE CHILDREN HAD CONGENITAL HEARING LOSS DURING PREGNANCY: A SURVEY STUDY <i>Indra Zachreini, Jenny Bashiruddin, Semiramis Zizlavsky, Susyana Tamin, Harim Priyono, Ika Dewi Mayangsari, Respati Ranakusuma, Natasha Supartono, Widayat Alviadi, Hedyta Damayanti, Dina Alia, Tengku Siti Hajar Haryuna, Juliandi Harahap, Nirza Wardo, Hidayatul Fitria, Beni Hidayat, Abila Ghanie, Ahmad Hifni, Muslim Kasim, Gustav Syukrinto, Ratna Anggraeni, Lina Lasminingrum, Muyassaroh, Novi Primadewi, Muhammad Arif Purwanta, Ashadi Prasetyo, Sagung Rai Indrasari, Mahatma Bawono, Nyilo Purnami, Dyah Indrasworo, Suardana, Eka Putra Setiawan, Putu Dian Ariyanti Putri, Komang Andi Dwi Saputra, Made Lely Rahayu, I Made Wiranadha, Arman Amar, Eva Nurfariyah, Eka Savitri, Tjandra Manukbua, Steward Keneddy Mengko, Augustien Yuliet Tamus</i>	 19
 TRANSADAPTATION AND VALIDATION OF TINNITUS PRIMARY FUNCTION QUESTIONNAIRE (TPFQ 12 AND TPFQ20) IN INDONESIA LANGUAGE <i>Nyilo Purnami, Nico Probosutejo, Budi Utomo</i>	 22
 THE ROLE OF STEM CELL REGULATING T REG CELL IN ALLERGIC RHINITIS <i>Lia Restimulia</i>	 24



EFFECTIVENESS OF SUBCUTANEOUS IMMUNOTHERAPY RELATED TO WHO-ARIA GUIDELINE IN KASIH IBU HOSPITAL DENPASAR <i>Tutwuri Handayani, Arif Dermawan</i>	26
A CHILD WITH AN EARRING FOREIGN BODY IN THE ESOPHAGUS DURING COVID 19 PANDEMIC <i>Steward Keneddy Mengko</i>	30
CORRELATION BETWEEN THE PERFORATION SIZE AND PATENCY OF EUSTACHIAN TUBE AND GRAFT UPTAKE IN INTACT CANAL WALL TYMPANOPLASTY SURGERY - A STUDY OF 32 BENIGN-TYPE CSOM PATIENTS <i>Artono, Nyilo Purnami, Edi Handoko, In Seok Moon</i>	33
THE PROFILE OF LARYNGOPHARYNGEAL REFLUX PATIENTS AT DR. SOETOMO TEACHING HOSPITAL, SURABAYA INDONESIA <i>Rizka Fathoni Perdana, Ami Pratami Munifah, Sri Herawati Juniati, Muhtarum Yusuf, Erni Rosita Dewi</i>	36



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NASAL WASHING DURING ABLATION AS AN EFFORT IN REDUCE NASAL SYMPTOM AND PREVENTING UPPER RESPIRATORY DISEASES

Asti Widuri¹, Rizka Fahriani¹, Salsa Farida²

¹Otorhinolaryngology Department, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta Indonesia

²Medical Student, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta Indonesia

Abstract

Introduction: Nasal washing (istinsyaq and istitsar) is part of ablution activity that perform as legal requirement for moslem praying five time times a day. It has many good effect to the hygiene of nasal mucosa by cleaning the pathogen or allergen, increasing humidity, and improving mucosiliare clearance.

Objective: This study aimed to assess the role of nasal washing during ablution in reduce nasal symptoms and preventing upper respiratory diseases.

Methods: A cross sectional study was conducted at dormitory student Universitas Muhammadiyah Yogyakarta. Assessment of ablution activity perform by mentor and divided into good, fair and poor criteria. All respondent were provided record of Score For Allergic Rhinitis (SFAR) questionnaire, Covid-19 infection and upper respiratory infection.

Results: The study showed that nasal rinsing significantly reduced the nasal symptoms and upper respiratory infection (istinsyaq $p=0.003$ and 0.003 , istitsar $p=0.006$ and 0.000) but not significant influenced to Covid - 19 infection with istinsyaq $p=0.696$ and istitsar $p=0.659$.

Conclusion: Nasal washing during ablution significantly influenced to reduce nasal symptom and upper respiratory infection, but not influenced to Covid-19 infection.

Article Info

Keywords:

ablution, nasal symptom, nasal washing, infection

*Corresponding author:

Address: FKIK UMY, Brawijaya Street, West Ringroad, Yogyakarta, 55284, Indonesia
e-mail: astiwiduri@gmail.com

1. INTRODUCTION

Human day of life are surrounded by pathogens, pollutants and other harmful substances. It can enter in our body through mouth, nose and eyes directly or (1) from contaminated hands and caused inflammation, infection or allergic process (2). A prevention of communicable disease relates to interrupt the transmission. Personal hygiene is an important practice in breaking the chain of transmission (3).

Cleanliness and purification or are one of the great exemptions of Islam. Ablution or wudu in arabic word is the specific action of washing part of body. Islam places great stress on cleanliness by doing wudu five or more times a day (for offering prayers), whether it is in physical or spiritual terms. Its activity also provide us good personal hygiene and can significantly prevent communicable diseases (4).

The breathing of water into the nasal cavity (istinsyaq) and out (istitsar) during ablution as Islamic approach corresponds to nasal rinsing (5). It activity has many effects to nasal mucosa, such as cleaning antigens pathogens, soften crusta, it also dilutes nasal discharges that easier for mucociliary movement to clear up the thick mucus, improves mucociliary motility, thus improving mucociliary clearance(6) (7). Nasal Irrigations (SNIs) also can reduce the viral load in the nasal cavities (8).

Nasal rinsing is a proven adjunctive technique in treating allergic rhinitis and rhinosinusitis(9)(10). However, the effectiveness of ablution's nasal rinsing in reducing symptoms of rhinitis and preventing URI had not been tested. Therefore, this study was conducted to evaluate the role of nasal rinse during ablution in preventing upper respiratory diseases.

2. MATERIAL AND METHODS

A cross sectional study was conducted with the respondent from student who signed the informed consent before participated in this study. Ethical clearance for this study was obtained from the Human Ethics Committee of Universitas Muhammadiyah Yogyakarta with number 136/PSK/Akd.2020.2021/210330/FKIKUMY. Data collection was performed at dormitory University Resident Universitas Muhammadiyah

Yogyakarta, by assess of ablution activity of the respondent, mark perform by mentor and divided into good, fair and poor criteria. All respondent were provided record of Score For Allergic Rhinitis (SFAR) questionnaire, Covid-19 infection and upper respiratory infection.

Descriptive statistics was done by presenting mean and standard deviation for numerical variables and frequency percentage for categorical variables. Chi-square test was applied to analyse the categorical variables. The level of significance was set at 0.05. SPSS software was applied for statistical analysis. Sub-heading (If any)

3. RESULT

All 135 student participated in this study were assess their wudu activity and fulfill questionnaire about SFAR, history of infection and identity. The percentage of male student was 36.3 % and 63.7 % female, its because of majority student were female. Perfect istinsyaq and istitsar activity perform by 25.9 % and 24.5 as showed in table 1.

Table 1. Data characteristic respondent

Parameter		Total N/%	P value
Age	Mean	18.53 (17-21)	
Gender	Male	49 (36.3)	NS
	Female	86 (63.7)	NS
Ablution	Istinsyaq good	35 (25.9)	NS
	Istinsyaq fair	86 (63.7)	NS
	Istinsyaq poor	14 (10.4)	NS
	Istitsar good	33 (24.4)	NS
	Istitsar fair	87 (64.4)	NS
	Istitsar poor	15 (11.1)	NS
SFAR	Allergic Rhinitis Y	27 (20)	NS
	Allergic Rhinitis N	108 (80)	NS
URI	Yes	47 (34.8)	NS
	No	88 (65.2)	NS
Covid	Yes	2 (1.5)	NS
	No	133 (98.5)	NS

From 35 (25.9%) respondent who good activity during istinsyaq only 1 (0.007%) report the SFAR symptom more than 7, from 86 (63.7%) respondent who fair activity during istinsyaq 20 (0.14%) report the SFAR symptom more than 7, and from 14 (10.5%) respondent who poor activity during istinsyaq 6 (0.04%) report the SFAR symptoms more than 7.

From 33 (24.4%) respondent who good activity during istitsar only 1 (0.75%) report the SFAR symptom more than 7, from 87 (64.4%) respondent who fair activity during istitsar 20 (0.14%) report the SFAR symptom more than 7, and from 15 (11.1%) respondent who poor activity during istitsar 9 (0.06%) report the SFAR symptoms more than 7.

From 35 (25.9%) respondent who good activity during istinsyaq 4 (0.02%) report the symptom of upper respiratory infection, from 86 (63.7%) respondent who fair activity during istinsyaq 36 (26.4%) report the symptom of upper respiratory infection, and from 14 (10.5%) respondent who poor activity during istinsyaq 7 (0.05 %) report the symptom of upper respiratory infection.

From 33 (24.4%) respondent who good activity during istitsar 2 (0.01%) report the symptom of upper respiratory infection, from 86 (63.7%) respondent who fair activity during istitsar 38 (28.1%) report the symptom of upper respiratory infection, and from 15 (11.1%) respondent who poor activity during istitsar 7 (0.05 %) report the symptom of upper respiratory infection.

Based on the result of hypothesis testing using chi-square test the role of nasal rinse during ablation in preventing allergic rhinitis, upper respiratory symptom, and covid infection, showed at table 2

Table 2. The influenced of istinsyaq to nasal symptoms and upper respiratory infection

Nasal Rinsing	Criteria	P value	
Istinsyaq	Good	Non AR	AR
	Fair	34	1
	Poor	66	20
Istinsyaq	Good	No Covid	Covid
	Fair	34	1
	Poor	85	1
Istinsyaq	Good	No URI symptom	URI symptom
	Fair	31	4
	Poor	50	36

Table 3. The influenced of istitsar to nasal symptoms and upper respiratory infection

Nasal Rinsing	Criteria	P value	
Istitsar	Good	Non AR	AR
	Fair	32	1
	Poor	67	20
Istitsar	Good	No Covid	Covid
	Fair	32	1
	Poor	86	1
Istitsar	Good	No URI symptom	URI symptom
	Fair	31	2
	Poor	49	38

4. DISCUSSION

The nose is one of the gateway between human body and external environment. Human airway is bombarded on an airflow containing with noxious gas, allergen and pathogens micro organisme. As an initial contact point the respiratory mucosa of nasal cavity serves multiple roles including physical defense such thermoregulation, moisturization and removal of airborne particles. Its also chemical defense to infectious agents by innate immune mechanisms including mucociliary clearance, bitter taste receptors, sinonasal epithelial barrier function, and innate immune effector cells (11).

Epithelial cells at nasal cavity form the first physiological barrier against environmental invasion by pathogens and allergens. Tight junctions (TJ), have a critical role in the maintenance of epithelial barrier function. Impaired TJ structures caused the dysfunction of epithelial might be involved in the initiation or progression of diseases (12). Epithelial TJ

can be affected by protease activities produced by allergen, so the nasal washing may improve nasal mucosa function through several physiological effects as barrier enforcing (13). The statement support to the result of this

study the nasal washing during ablation (istinsyaq and istitsar) significantly prevent SFAR score and upper respiratory diseases with p value < 0.05.

Ablution movement by washing hands, washing the nostrils, washing the face, and ears is the healthy living behavior to reduce pathogen and allergen enter to our body (14). Nasal rinsing can be included as part of intervention reducing URI such as vaccination and use faca-mask among male Hajj pilgrims (15). Although in this study the good istinsyaq and istitsar not influenced to the Covid-19 infection, its because of the research during early pandemic and the respondent with minimal social interaction at dormitory. Ablution also not make changing of bacteria pattern in nasal cavity (8). Beneficial effects of each step of ablation is scientifically supported but needs further research in this direction (3).

5. CONCLUSION

Nasal washing during ablation significantly influenced to reduce nasal symptom and upper respiratory infection, but not influenced to Covid-19 infection.

ACKNOWLEDGMENT

Researchers say thank you to dormitory resident Universitas Muhammadiyah Yogyakarta who participated to this study.

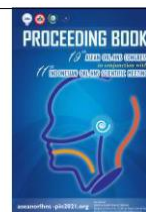
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CHARACTERISTICS AND BACTERIAL PATTERNS OF NECK ABSCESS IN MOHAMMAD HOESIN GENERAL HOSPITAL PALEMBANG ON JANUARY 2020 TO JUNE 2021

M. Tauhid Lestario¹, Lisa Apri Yanti²

¹Department of Otorhinolaryngology-Head and Neck Surgery, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

²Laryngology Consultant, Department of Otorhinolaryngology-Head and Neck Surgery, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

Abstract

Introduction: Deep neck infection is defined as a collection of pus in potential spaces and facial planes in the deep neck. The incidence of deep neck space infection is 1/100,000 in adults and 2/100,000 in children. Risk factors such as age, oral hygiene and comorbidities such as DM are aggravating factors in deep neck abscesses patients. Specimen identification via culture is considered very important to obtain the causative organism and determine the effective antibiotic.

Objective: The purpose of the study was to describe the characteristics and patterns of abscess bacteria in the ENT department of RSMH

Methods: This study is a retrospective descriptive study using medical record data in patients diagnosed with deep neck infections who were treated at the ENT department of RSMH from January 2020 to June 2021.

Results: From 48 patients, 30 men (62.5%) and 18 women (37.5%) were found and the age group of 31-45 years was found to be 18 people (37.5%). Most symptom onset was found at 0-1 weeks as many as 27 people (56.2%). The highest complaints were dysphagia in 32 cases (27.6%), trismus in 31 cases (26.7%), and odynophagia in 28 cases (24.1%). Odontogenic factors were found in 44 cases (91.7%). Most abscesses were located in multispaces, as many as 26 cases (54.2%), while in single space as many as 22 cases (45.8%), with the most location being submandibular in 8 cases. Diabetes was found as comorbid in 7 cases (46.7%). The most bacterial findings in culture were *Klebsiella pneumoniae* ssp *pneumoniae* in 6 cases (13.3%) and sensitive antibiotics including ciprofloxacin, meropenem, and tigecycline in 9 cases (23.1%). The most common complication was mediastinitis in 7 cases (77.7%).

Conclusion: *Klebsiella pneumoniae* ssp *pneumoniae* is the most common bacteria found in deep neck infections with sensitive antibiotics including ciprofloxacin, meropenem, and tigecycline

Article Info

Keywords:

deep neck abscess, bacterial culture, antibiotics

*Corresponding author:

e-mail: mt.lestario@gmail.com

1. INTRODUCTION

Deep neck infection is defined as an infection of the potential spaces and facial planes of the neck, which is accumulation of pus in the potential deep neck spaces. The widespread use of antibiotics today has reduced the incidence of abscesses, but this condition is still common and remains a challenge because it can cause dangerous complications such as mediastinitis, airway obstruction, jugular vein thrombosis, pericarditis, pleural empyema, and even death. There are many factors that are risk factors for deep neck abscesses, for example in old age and diabetes mellitus.^{1,2}

The incidence of deep neck space infection is 1/100,000 in adults and 2/100,000 in children. The diagnosis of deep neck space infection is established based on the history, physical examination, and supporting examinations, such as blood laboratory examinations and pus culture, as well as radiological examinations.^{3,4}

A pus culture is required if there is suspicion of an abscess. Specimens are collected by aspiration of a localized abscess or other surgical procedure. The bacteria that cause abscesses are usually polymicrobial, consisting of a mixture of aerobic, microaerophilic, and anaerobic. Infections originating from the oropharynx are mostly caused by normal flora in the upper respiratory tract, such as *Streptococcus* and *Staphylococcus*. The most common organisms are aerobic *S. viridans*, *H. hemolytic Streptococcus*, *Staphylococcus*, *Klebsiella pneumoniae*, anaerobic bacteriodes, and *peptostreptococcus*.^{3,4}

It is estimated that the incidence of deep neck abscesses has decreased significantly since the widespread use of antibiotics. To get the most effective antibiotics, it is necessary to examine the culture of bacteria and test the sensitivity of antibiotics to bacteria. The purpose of the study was

to describe the characteristics and patterns of abscess bacteria in the ENT department of RSMH.^{2,5}

2. MATERIAL AND METHODS

This study is a retrospective descriptive study on the bacterial pattern of deep neck abscesses in the ENT section of the Mohammad Hoesin Hospital (RSMH) Palembang. The data comes from the medical records of patients in the ENT department of the RSMH. The research was conducted from January 2020 to June 2021.

The population and sample of this study were all patients diagnosed with abscess in the laryngeal-pharyngeal division of the ENT department from January 2020 to June 2021. The samples included in this study were all patients diagnosed with deep neck abscess who went to the ENT department. The collection of pus samples in the abscesses were carried out at the microbiology laboratory of RSMH. The criteria for patients who were not included in the study included patients with deep neck abscesses who were not subjected to pus sampling. The number of samples obtained is 48 patients).

3. RESULT

Table 1. Distribution of subjects based on demographic characteristics (n=48)

Variable	Amount (n)	Percentage (%)
Type sex		
Man	30	62.5
Woman	18	37.5
Age group		
0-15 year	3	6.3
16-30 years old	11	22.9
31-45 years old	18	37.5
46-60 years old	9	18.8
>60 years old	7	14.5

Table 2. Distribution of subjects according to the onset of abscess occurrence (n=48)

Variable	n	Percentage (%)
0-1 week	27	56.2
2 weeks	11	22.9
3 weeks	3	6.3
4 weeks	4	8.3
>1 month	3	6.3

Table 3. Distribution of subjects based on clinical symptoms and risk factors

Variable	n	Percentage (%)
Clinical Symptoms		
Fever	20	17.3
Shortness of breath (dyspneu)	5	4.3
Difficulty opening the mouth (trismus)	31	26.7
Difficulty swallowing (dysphagia)	32	27.6
Painful swallowing (odynophagia)	28	24.1
Risk factors		
Teeth cavities	44	91.7
Bones	4	8.3

Table 4. Distribution of subjects by location of abscess (n=48)

Variable	n	Percentage (%)
Multispace	26	54.2
Parapharyngeal & submandibular space	18	37.5
Retropharyngeal & submandibular space	4	8.3
Retropharyngeal & pretracheal space	2	4.2
Temporal & submandibular space (prevertebral space)	2	4.2
Single space	22	45.8
Retropharyngeal space	3	6.3
Parapharyngeal space	2	4.1
Submandibular Space	8	16.6
Parotis space	1	2.1
Masticator room	1	2.1
Peritonsillar space	7	14.6

Table 5. Distribution of bacterial patterns based on pus culture results (n=48)

Variable	n	Percentage (%)
<i>Pseudomonas aeruginosa</i>	2	4.5
<i>Streptococcus gordonii</i>	1	2.2
<i>Pneumonia ssp</i>	1	2.2
<i>Klebsiella pneumonia ssp pneumoniae</i>	6	13.3
<i>Escherchia coli</i>	3	6.7
<i>Pseudomonas ssp</i>	1	2.2
<i>Staphylococcus capitis</i>	1	2.2
<i>Streptococcus anginosus</i>	1	2.2
<i>Staphylococcus haemolyticus</i>	2	4.5
<i>Acinobacter baumani</i>	2	4.5
<i>Staphylococcus aureus</i>	1	2.2
<i>Streptococcus sanguinis</i>	1	2.2
<i>Lactococcus garvieae</i>	1	2.2
Sterile/no growth	22	48.9

Table 6. Distribution of antibiotics sensitivity based on pus culture

Variable	n	Percentage (%)
Ciprofloxacin	9	23.1
Meropenem	9	23.1
Tigecycline	9	23.1
Ceftazidime	1	2.6
Cefepime	1	2.6
Ertapenem	2	5.1
Clindamycin	2	5.1
Erythromycin	2	5.1
Benzylpenicillin	2	5.1
Vancomycin	2	5.1

Table 7. Distribution of observed complication in subjects

Variable	n	Percentage (%)
Mediastinitis	7	77.7
airway obstruction	2	22.3

Table 8. Distribution of subjects based on comorbidity

Variable	n	Percentage (%)
Diabetes mellitus	7	46.7
Hypertension	5	33.3
Pneumonia	2	13.3
Pregnant	1	6.7

4. DISCUSSION

In this study, deep neck abscesses were often found in 30 men (62.5%) and 18 women (37.5%). And the most age came from productive adults, namely the age of 31-45 years as many as 18 people (37.5%), where in the children age group (0-15 years) it was found in 3 people (6.3%), while age more than 60 years found 7 people (14.5%). In the study, Brito et al. reported that the incidence in children was relatively low, this may be due to a history of antibiotic use, especially in conditions of flu and other viral infections, which are more common in children than in adults. This is consistent with the study of Yang et al., who reported that of 130 patients, 79 (60.8%) were male and 51 (39.2%) were female with a mean age of 32 years. Syaiful, et al in their study in Surabaya reported that 102 patients (62.96%) of deep neck abscess patients were male and 60 patients (37.04%) were female with the highest age being from the 40-60 year age group of 55 patients (33.95%). This is probably because men tend to neglect oral hygiene compared to women, and tobacco consumption is found to be higher in men which affects orodental hygiene which can cause dental infections and deep neck space infections.^{1,3,5}

Based on the onset of events, in this study report, the most occurrences were at 0-1 weeks, namely 27 people (56.2%), then 2 weeks of onset were 11 people (22.9%). There was also an onset of more than 1 month found in 3 case (6.3%). This is in accordance with the report in Brito et al. where in his study reported the mean time from symptom onset to diagnosis was 8 days with a symptom range showing between 2-20 days and the main symptoms were fever and neck pain.^{6,7}

The most common symptoms found are difficulty swallowing (dysphagia) in 32 cases (27.6%), trismus in 31 cases (26.7%), followed by complaints of painful swallowing (odynophagia) as many as 28 cases (24.1%). In the study of Yang et al, fever, trismus, neck pain and odynophagia were the main complaints in cases of deep neck infections in both children and adults. Odynophagia was found in 47.7% in children and 66.3% in adults. Gujrathi et al, in their study report that most of the patients complained of pain in 81.48% of patients, followed by swelling of the neck in 77.78%, pain of swallowing in 39.26% and pain of opening the mouth in 31.11% of patients.^{1,8-10} Regarding risk factors, in this report almost all cases of infection were obtained from odontogenic factors, namely 44 cases (91.7%), while bone risk factors were found in 4 case (8.3%). This is in accordance with the study of Syaiful et al, who reported that the main cause of deep neck infections was odontogenic infections and other dental infections, which were 112 patients out of a total of

162 subjects studied (69.14%).^{1,5,11} Multispace involvement in deep neck infections was common in all age groups, similar to the study of Brito et al, which had multispace involvement in 41.8% of adults with deep neck infections. According to this case report, the most spread was found in

multispace, which involved more than one space in the deep neck, as many as 26 cases (54.2%), while in single space as many as 22 cases (45.8%), with the most locations being submandibular in 8 cases and peritonsil in 7 cases. Deep neck infections in adults often involve multiple spaces, leading to serious complications and with a more severe clinical course than in children. Yang et al reported the most common location in children was the parapharyngeal space in 18 patients (40.9%), followed by the submandibular space in 8 patients (18.2%), the retropharyngeal space in 5 patients (11.4%). In the adult group, the most common sites were multispace in 30 patients (34.9%), followed by parapharyngeal in 17 patients (19.8%), submandibular space in 12 patients (14.0%), whereas adult patients had multispace infections more often than children. 1,3,6,7

Comorbid factors that underlie deep neck infections, mostly found a history of diabetes in patients, namely in 7 people (46.7%), then hypertension was found in 5 people (33.3%), pneumonia in 2 people (13.3%), and patients with the condition pregnant 1 person (6.7%). Among the major diseases associated with deep neck infection the most common diabetes mellitus was found in 36.30% and 1.48% of cases of deep neck infection with pregnancy were found in the case report of Gujrathi et al. In the study of Yang et al, of the 27 patients who had comorbid factors, 17 of them had diabetes mellitus. In DM patients, hyperglycemia conditions can disrupt several body defense mechanisms, such as the function of neutrophils which act as adhesion, chemotaxis and phagocytosis which are impaired and have an impact as predisposing infections and complications in deep neck infections, so that any conditions that interfere with host cell immunity, will predispose individuals to develop deep neck infections. 1,3,6,10,11

Based on the results of this case report, the most common bacteria found were *Klebsiella pneumoniae ssp pneumoniae* as many as 6 cases (13.3%), then *Escherichia coli* as many as 3 cases (6.7%), followed by *Pseudomonas aeruginosa*, *staphylococcus haemolyticus*, *acinobacter baumannii* with 2 cases each (4.5 %). From the research report, some of the dominant aerobic bacteria are *Streptococcus viridians*, *Klebsiella pneumoniae*, *Staphylococcus aureus*, while the dominant anaerobic bacteria are *Prevotella*, *Peptostreptococcus*, *Fusobacterium* and *Bacteroides*. Although many previous studies reported *Streptococcus* species as bacteria that are often isolated in deep neck infections, geographic factors and use of antibiotics can influence the variety of bacteria isolated in culture results from various studies. Furthermore, the second most common germ that is often isolated is *Klebsiella pneumoniae*, where this type of bacteria is higher, especially in people with diabetes mellitus, both in adults and children. Tiwana et al, in their research reported that the majority of culture results are sterile (42.6%). It may be due to high dose intravenous antibiotic or empiric antibiotic usage before abscess drainage. Gujrathi et al, in their research reported that the most common microorganisms found in deep neck space infection were *streptococcus pyogenes* (30,37%) & *staphylococcus aureus* (22,97%). 1,3,10

Based on the culture results of this case report, it was found that the highest sensitive antibiotics were ciprofloxacin, meropenem, and tigecycline in 9 cases (23.1%). Based on Rijal et al, the results of the antibiotic sensitivity test of pus culture showed the highest sensitivity to meropenem at 73.58%, cefoperazone-sulbactam 69.36%, and oxacillin 66.67%. While Beka et al report, the antibiotic agents used in Greece include the administration of a single intravenous antibiotic or a combination of penicillin- clavulanic acid, ampicillin-sulbactam, clindamycin, and metronidazole. 1,5,7

Based on this case report, the following complications were found including mediastinitis in 7 cases (77.7%) and the incidence of upper airway obstruction so that a tracheostomy was performed in 2 cases (22.3%). In the research report of Brito et al, there were two cases with mediastinitis (1.9%), namely in adults and involving multiple neck spaces. In mediastinitis, patients often complain of chest pain or shortness of breath. Har-el et al, described that involvement of the floor of the mouth and retropharyngeal space is more associated with the incidence of airway obstruction and a greater need for tracheostomy. 1,6,10,12

5. CONCLUSION

Deep neck infections are a common and challenging condition for the otolaryngologist, and should be treated in an emergency. In this study, odontogenicity was the most common etiologic factor in deep neck

infections. Therefore, prevention of deep neck infections can be done by providing awareness to the public about dental and oral hygiene and routine dental check-ups. In addition, it is also important to pay special attention to high-risk groups such as the elderly and people with diabetes mellitus, where systemic disease conditions can cause life-threatening complications.

Early diagnosis and treatment are essential, so all patients should be started on empiric intravenous antibiotic therapy, which is then adjusted for bacterial culture results and sensitivity. In this case report, the most common bacteria found were *Klebsiella pneumoniae ssp pneumoniae*, with sensitive antibiotics including ciprofloxacin, meropenem, and tigecycline.

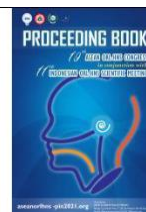
Nasal washing during ablation significantly influenced to reduce nasal symptom and upper respiratory infection, but not influenced to Covid-19 infection.

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PROCEEDING BOOK
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DIAGNOSIS AND MANAGEMENT OF LARYNGEAL ACTINOMYCOSIS

Aji Kusuma^{1*}, Lisa Apri Yanti^{2}**

¹Department of Otorhinolaryngology-Head and Neck Surgery, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

²Department of Otorhinolaryngology-Head and Neck Surgery, Faculty of Medicine, Universitas Sriwijaya, Palembang, Indonesia

Abstract

Introduction: Actinomycosis is a chronic granulomatous infection caused by anaerobic gram-positive bacteria. Actinomycosis is very rarely found in the larynx. This disease is often misdiagnosed due to its non-specific symptoms and usually resembles a malignant or granulomatous lesion.

Case report: A 49-year-old male presented with a chief complaint of hoarseness. Initial examinations revealed the presence of a laryngeal mass accompanied by pulmonary tuberculosis. Due to upper airway obstruction, tracheostomy was performed. After receiving tuberculosis treatment, the patient underwent laryngeal mass extirpation using direct laryngoscopy with an endoscopic approach. Pathology examination confirmed the diagnosis of laryngeal actinomycosis. After 5 months of antibiotics, the patient showed no laryngeal abnormalities. The tracheostomy cannula was removed followed by stoma closure. Follow up revealed no abnormalities.

Conclusion: Laryngeal actinomycosis is uncommon, and may present as a laryngeal mass that may cause airway obstruction. Due to its rareness, thorough examination is needed for differential diagnosis. The gold standard for diagnosis is pathology confirmation. Management consists of antibiotic administration.

Article Info

Keywords:

actinomycosis, larynx, laryngeal mass, tracheostomy, direct laryngoscopy

*Corresponding author:

Address: Jenderal Sudirman Road,
Palembang, South Sumatra, 30126, Indonesia
e-mail: ajikusuma@hotmail.com

1. CASE REPORT

This is a report of a 49-year-old male, works as a rubber tapper and welder living outside Palembang, who was admitted to the ORL-HNS department, emergency unit of Dr. Mohammad Hoesin Hospital Palembang (RSMH) with a main complaint of lump-in-throat sensation since 4 months before hospital admission. Lump-in-throat sensation occurs continuously and followed by hoarseness. No complaints of choking when eating and drinking. Approximately 2 weeks before hospital admission, the patient experienced shortness of breath, regardless of position and weather, and worsening of hoarseness and lump-in-throat sensation. The patient also complained of occasional choking when drinking, but was still able to eat solid food. There is a history of smoking. He was first admitted to a local hospital, but was then referred to RSMH Palembang.

On general physical examination, the patient was conscious, composed, with vital signs of blood pressure within normal limits, pulse 115bpm, breathing 28x/minute, and oxygen saturation 97%. Thoracic examination revealed inspiratory stridor with suprasternal and epigastric retraction. Neck examination showed no lumps or enlarged lymph nodes. Physical examination of the heart and lungs were within normal limits. Examination of the nose, ears and throat within normal limits. On indirect telelaryngoscopy, a yellowish granular mass was observed, covering plicae vocalis and plicae ventricularis.



Picture 1. Indirect laryngoscopy examination

Laboratory tests showed leukocytes count of 15.330/mm³ and other laboratory tests were within normal limits. Chest X-ray shows impression of cardiomegaly, bilateral pulmonary tuberculosis, and right pleural effusion. On AP/Lateral soft tissue cervical X-ray, soft tissue mass was observed on the neck region, parallel to C5-C6 vertebrae. The patient was consulted to the internal medicine department, and diagnosed with suspected new case of pulmonary tuberculosis. The patient was prescribed

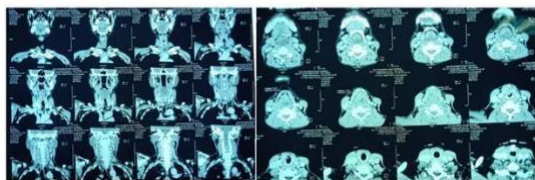
oral azithromycin therapy and oral N-acetylcysteine, and was given recommendations to perform AFB I/II/III and gene expert examinations. Results of AFB I/II/III examination were +/- and gene expert detected evidence of *Mycobacterium tuberculosis* (MTB).



Picture 2. a. Chest x-ray. B. Cervical x-ray

The patient was diagnosed with upper airway obstruction stage II et causa laryngeal mass and pulmonary tuberculosis. Awake tracheostomy was performed, followed by anti-tuberculosis drug combination for 6 months.

Three months later, laryngeal mass biopsy was performed. Evaluation of the larynx showed yellowish granular mass covering the supraglottic area. Plicae vocalis and plicae ventricularis was unable to be assessed. Biopsy of the laryngeal mass was performed with direct laryngoendoscopic approach using biopsy forceps with evaluation of bleeding, and the collected tissue was sent to the anatomic pathology department. Anatomical pathology examination revealed actinomycosis and fungal infection with necrotic tissue in the larynx. CT scan of the larynx was performed, showing inhomogeneous density masses in the oropharynx, hypopharynx to the epiglottis causing intraluminal obstruction, with no visible destruction of the cricoid and arytenoid cartilages, no enlargement of neck lymph nodes, well-positioned tracheostomy, and an impression of pulmonary tuberculosis in both lung areas. As cases of actinomycosis often occurs in immuno-deficient patients, anti-HIV test is performed, yielded negative results. The patient was given 625 mg amoxicillin/ clavulanic acid every 8 hours for 6 months, fluconazole 150 mg every 24 hours for 2 weeks, and proton pump inhibitor drug therapy.



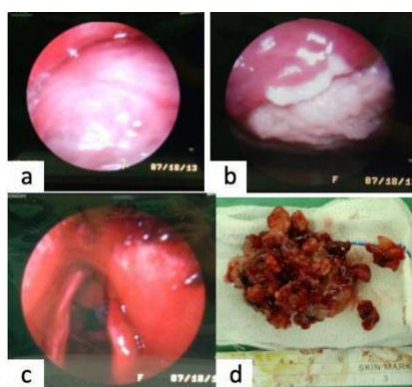
Picture 3. Laryngeal CT Scan with contrast, showing mass

Laryngeal evaluation shows yellowish granular mass on the epiglottis

covering the supraglottic area. Plicae vocalis and plicae ventricularis was unable to be assessed. Extirpation of the laryngeal mass was performed with forceps, followed by evaluation for bleeding, and the collected tissue specimen was sent to anatomic pathology department for further examination. Previously prescribed therapy was continued.

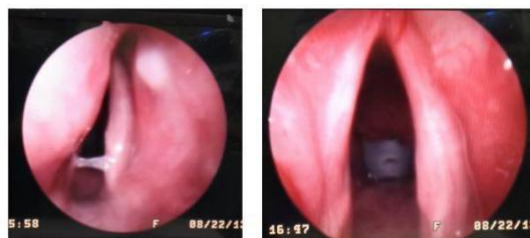
On the ninth day after surgery, the patient was followed-up for outpatient visit at ENT-NS department. Follow-up visit shows improvements in prior complaints of coughing and lump-in-throat sensation, with no chest tightness.

Telelaryngoscopy examination of the anterior epiglottis showed fibrinous tissue, absence of mass, absence of blood clot, absence of blood flow, absence of pus, symmetrical bilateral movement of the plicae vocalis and plicae ventricularis, and edema of the arytenoid and plicae ventricularis. Previous anatomic pathology examination results reveal actinomycosis of the larynx.



Picture 4. a and b. Laryngeal mass before procedure, c. After mass extirpation, d. Mass of the larynx: 2.8 cm x 2 cm x 0.5 cm in size

Follow-up evaluation of the larynx shows thickening of the left plicae ventricularis with a smooth surface appearance. Reduction of the left plicae ventricularis was performed with cautery, followed by evaluation for bleeding, and thickened tissue was obtained using forceps and sent to department of anatomic pathology for further examination, resulted in inflammatory polyps in the larynx region. Evaluation of AFB I/II/III examination in patients showed -/-/- results. Chest X-ray evaluation was performed, and the patient was declared cured from pulmonary tuberculosis.



Picture 5. Intraoperative image of 3rd direct laryngoscopy (before and after procedure)

Laryngeal evaluation after 5 months of amoxicillin/clavulanic acid treatment showed no laryngeal masses and no abnormalities in the laryngeal tissue, followed by removal of tracheostomy cannula. After 2 months, no abnormalities in the laryngeal tissue was observed.



Picture 6. Figure 6. Intraoperative image of 4th direct laryngoscopy (before and after procedure)

2. DISCUSSION

This is a case report of a laryngeal actinomycosis in a 49-year-old male. Actinomycosis is more common in people aged 20-60 years with a peak incidence between the ages of 40-50 years. The majority of patients are male with a ratio of 3:1, due to higher prevalence of males having worse oral hygiene and more common findings of oral trauma. Laryngeal actinomycosis is more common between the ages of 40-50, which is accordance to this case, however, laryngeal actinomycosis can occur in any age group. Laryngeal actinomycosis is usually discovered incidentally after surgical exploration. In this case, the patient has several risk factors, which includes smoking, occupational exposure to smoke (welder) and comorbidities of tuberculosis. Chronic inflammation is thought to be a contributing factor in laryngeal actinomycosis. Chronic inflammation due to smoking and exposure to inhalation may cause damage to the mucosal barrier in the larynx, which facilitates a favorable environment for the growth of *Actinomyces* sp. Currently there are no literature that describes the relationship between pulmonary tuberculosis and laryngeal actinomycosis, however, *Mycobacterium tuberculosis* infection may expand, causing secondary infection and damages the laryngeal mucosa. Abraskim et al reported four cases of co-infection with pulmonary actinomycosis and tuberculosis infection, in which co-pathogens synergistically inhibit host defense mechanisms or reduce oxygen levels in affected tissues, which promote growth of *Actinomyces* sp. The most common symptom of chronic cough, which is also the most common symptom of pulmonary tuberculosis patients, causing irritation of the laryngeal mucosa and damages the mucosal barrier, paving the way for invasive diseases.^{2,3,5}

Symptoms of laryngeal actinomycosis ranges from asymptomatic to severe. Symptoms may include voice changes, dysphagia, a lump in the throat, coughing, and even total airway obstruction. Googe et al suggested that the most frequent symptoms were dysphonia (61.5%), dysphagia (34.6%) dyspnea (17.2%), and cough (11.50%). In this case, the patient's main complaint was a lump in the throat followed by hoarseness since 4 months before admission, followed shortness of breath, and coughing and choking when drinking. The slow progression of laryngeal actinomycosis means that there may be a long time period between onset of symptoms (unspecified) and the clinical diagnosis (up to 6-12 months), which is associated with erosion and tissue damage in the affected area. Complaints of laryngeal actinomycosis are related to its affected location, including the supraglottis, glottis or subglottis. Impaired swallowing function with a lump-in-throat sensation and aspiration of the larynx is associated with the location of the supraglottic mass, causing the epiglottis unable to cover the area of rima glottidis during swallowing phase. Hoarseness worsens slowly progressively to shortness of breath is caused by airway obstruction, which resulted from disruption of vocal cord vibrations due to incomplete closure of rima glottidis rhyme caused by tumor mass. Coughing usually occurs due to secretions flowing into the larynx and occurs mainly after swallowing movements.^{2,4,6}

Standard measures required for diagnosis include clinical examination using a rigid or flexible endoscope to allow a thorough assessment of the surface condition of the primary tumor and the mobility of the vocal cords. Indirect telelaryngoscopy of this patient revealed a yellowish granular mass presenting over the plicae vocalis and plicae ventricularis. Laryngoscopy is an examination to determine the appearance of the lesion which is often represented as a mass covered with fibrotic tissue. However, this lesion is not specific because laryngeal actinomycosis may also present as nodules, ulcers, or papillomatous lesions. The presence of a tumor mass, covering almost the entire rima glottidis may potentially cause airway obstruction, leading to stridor, cyanosis when eating, difficulty

breathing and is potentially life threatening.^{2,2,25,26}

Laboratory results showed leukocytes counts of 15.330/mm³ and non-reactive anti-HIV. Common laboratory findings include mild leukocytosis, increased erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) levels, which indicate the presence of bacterial infection, but are not specific for Actinomyces infection. Some cases of laryngeal actinomycosis occur in immunosuppressed patients as a result of opportunistic infections in severely immuno-compromised patients, but is very rarely found in immunocompetent patients. In this case, there are no risk factors that may alter the immune system.^{2,4,7}

Neck soft tissue X-ray and CT scan of the larynx revealed soft tissue mass in the neck region. Imaging techniques usually reveal non-specific findings, contributing only to determining the radiological features of the mass and its involvement in adjacent soft tissues. This infection usually spreads in close proximity to surrounding tissues or organs, possibly involving only the soft tissue or bone or even both, eventually producing multiple sinus passages. This infiltrative property can be correlated with the proteolytic enzymes released by Actinomyces. Radiological techniques only provide quantitative information of borders, homogeneity and content density, localization, and invasion of the lesion to surrounding organs. Actinomycosis may be mistaken for a neoplasm on CT and MRI scans with an infiltrative, mass-like appearance. In one case series, six of seven patients with actinomycosis were initially misdiagnosed with a malignancy on imaging studies.^{3,8,9}

Management of laryngeal actinomycosis includes maintenance of the airway and medical intervention. Overall management refers to Jackson's criteria. Tracheostomy is the gold standard for treatment of upper airway obstruction, but tracheostomy has its own complications, both in the short and long term.¹⁰

Pathology examinations revealed histopathological properties of actinomycosis and fungal infections with necrotic tissue in the larynx. Low host immunity and laryngeal mucosal barrier disruption can lead to laryngeal infection. Actinomycosis and fungal infections can occur due to the formation of biofilms, providing resistance to host clearance pathways and antimicrobial agents. The most common species of fungus is *Candida albicans*, which is a component of the normal microflora in the digestive tract. This fungus is considered to exist in hospital environment such as circulating air, surfaces such as floors and roofs, or hospital food. Many authors have defined *Candida* species as the most common fungal agent isolated from the mucus production of patients with pulmonary tuberculosis. Studies of importance of this infection has always been a controversial, due to the fact that nearly 32.5% of throat of healthy people are *Candida* carriers. This situation can lead to contamination of the sputum sample. Microbiological sampling of lung parenchymal lesions obtained by flexible bronchoscopy supports the diagnosis. Combined bacterial and fungal infections increase the frequency and severity of disease. The patient was prescribed amoxicillin/ clavulanic acid and fluconazole therapy. Amoxicillin is a broad-spectrum antibiotic effective against Actinomyces bacteria. Actinomycosis is a polymicrobial infection, so the initial stage of treatment should include treating other bacteria found at the site of infection. Although Actinomyces does not produce β -lactamases, administration of β -lactamase inhibitors such as clavulanate or tazobactam is recommended in order to provide additional coverage against potential β -lactamase-producing bacteria such as *Staphylococcus aureus*, anaerobic gram-negative bacteria, and Enterobacteriaceae. Administration of oral antifungal drugs such as fluconazole or itraconazole for 3-4 weeks, is the first-line drug in fungal infection of the larynx. According to a case report of Ghosh P et al., 3 weeks of combined antimicrobial penicillin G and fluconazole antimicrobial therapy resulted in favourable outcomes in coinfection of pulmonary actinomycosis and fungal infections. Patients given fluconazole for 4 weeks yielded good response to fungal infections of the larynx with no finding of fungi on following histopathological examination.^{2,7,11}

Although antibiotics are the cornerstone of treatment for actinomycosis, surgical resection of the infected tissue may also be necessary in some cases, especially if extensive necrotic tissue, sinus tracts, or fistulas occur. Indications for surgery in actinomycosis should be individualized, adjusted based on the nature and extent of the disease, the presence of complications, and patient's clinical response to specific antimicrobial therapy. Surgery that can be performed on laryngeal actinomycosis is microscopic laryngeal surgery, assisted with forceps,

CO₂ laser or microdebrider. The principle of operative therapy is to obtain maximum tumor resection possible while also maintaining normal structure of the surrounding tissue. Excision of laryngeal actinomycosis with CO₂ laser yield easy removal of the tumor with minimal trauma and impaired function. In this case, microscopic laryngeal surgery was performed, since complication of airway obstruction has already occurred in this patient. The goal of operative surgery is to remove the mass, provide a safe and airy airway, and shorten the required time for antibiotics administration. Even if surgery is performed, administering antibiotics is paramount to remove any remaining residue and prevent further need for surgery. Standard medical management of actinomycosis includes long-term antibiotics for 6-12 months to prevent relapse, but it may be shortened if optimal surgical resection of the infected tissue has been performed, no bone involvement, and satisfactory respond to treatment was achieved. Kolditz et al reported that of 49 people with pulmonary actinomycosis, 24 people were given antibiotics \leq 6 months and obtained 100% cure rate, and six people who were given antibiotics for less than 3 months experienced relapses or local complications, thus it is recommended that antibiotics were given for not less than 3 months in patients with pulmonary actinomycosis. In this case, the patient was given amoxicillin/clavulanic acid therapy for 5 months following mass extirpation, leading to a favorable response with no findings of a granular mass on direct laryngoscopic evaluation and histopathology.^{1,2,4,12}

A cross sectional study was conducted with the respondent from student who signed the informed consent before participated in this study. Ethical clearance for this study was obtained from the Human Ethics Committee of Universitas Muhammadiyah Yogyakarta with number 136/PSK/Akd.2020.2021/210330/FKIKUMY. Data collection was performed at dormitory University Resident Universitas Muhammadiyah Yogyakarta, by assess of ablation activity of the respondent, mark perform by mentor and divided into good, fair and poor criteria. All respondent were provided record of Score for Allergic Rhinitis (SFAR) questionnaire, Covid-19 infection and upper respiratory infection.

Descriptive statistics was done by presenting mean and standard deviation for numerical variables and frequency percentage for categorical variables. Chi-square test was applied to analyse the categorical variables. The level of significance was set at 0.05. SPSS software was applied for statistical analysis. Sub-heading (If any)

3. CONCLUSION

Laryngeal actinomycosis is a rare, chronic granulomatous infection of the larynx caused by Actinomyces sp. which is most likely to be misdiagnosed. Prompt detection and management of airway obstruction is crucial for the patient. Predisposing factors such as diabetes, tobacco consumption and pre-existing infections may play a role in the development of actinomycosis. Diagnosis is confirmed through isolation of Actinomyces. Laryngeal actinomycosis is managed with long-term antibiotics, preferably penicillin or amoxicillin, and surgical resection may reduce the duration of antibiotics administration.

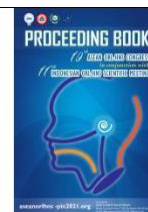
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GENETIC SCREENING FOR CHILDREN WITH HEARING IMPAIRMENT IN SURABAYA SPECIAL SCHOOL

Nyilo Purnami^{1*}, Puguh Setyo Nugroho², Hamam Kusumagani³

¹ Dept of ORL-HNS, Fac. of Medicine Airlangga University/ Dr. Soetomo Academic Hospital, Surabaya, East Java

² Dept of ORL-HNS, Fac. of Medicine Airlangga University/ Dr. Soetomo Academic Hospital, Surabaya, East Java

³ Dept of ORL-HNS, Fac. of Medicine Airlangga University/ Dr. Soetomo Academic Hospital, Surabaya, East Java

Abstract

Introduction: Congenital deafness can be caused by genetic, environmental, and the interaction of these two factors. Genetic factors play about 50-75% as a cause of hearing loss. Hearing loss related to genetic factors/ Congenital Hearing Loss (CHL) can be found in two forms, namely: Syndrome Hearing Loss (SHL) and Non-Syndromic Hearing Loss (NSHL).

Objective: to initiate the genetic hearing loss screening in Surabaya, to knowing the prevalence of genetic hearing loss in Surabaya special school, identify the gene mutation for providing the next genetic mapping in Indonesia and identify the gene mutation in family (pedigree).

Methods: The design of the research are observational, cross sectional, and randomized Study. The sample was examine by otoscopy and pure-tone audiometry. Blood samples were obtained and DNA was extracted from 5 ml blood using standard procedures.

Results: There is 49 children, we found 3 genetic mutation (PDS or SLC26A, GJB or connexin 26 and mRNA or MTRNR1 gene mutation).

Conclusion: Autosomal recessive mutations in the GJB2/connexin 26 gene are common in nonsyndromic hearing loss. The genetic hearing loss screening has been initiated in students of Deaf school in Surabaya. The prevalence was found in 3 (6,1 %) students from total 49 students. Mutation varian of genetic Hearing Loss was detected in each 3 children in school, included the most prevalence variants: GJB2, SLC26A4, dan 12SRNA mitokondria.

Article Info

Keywords:

genetic screening, children, hearing impairment

*Corresponding author:

Address: Perum Pandugo, Surabaya, East Java, Indonesia

e-mail: nyilo@fk.unair.ac.id

1. INTRODUCTION

Hearing is an important factor in the ability to speak and communicate verbally. The learning process for hearing babies and children is very complex and varied because it involves aspects of growth and development, embryological development, anatomy, physiology, neurology and audiology. Congenital hearing loss is one of the most common congenital abnormalities in humans with an incidence of 1-2 in 1000 newborns. At high levels of family relationship, the incidence increases to 3-4 out of 1000 population. To prevent this, many countries including Germany conduct newborn hearing screening tests with Oto Acoustic Emission (OAE) and Brainstem Evoked Response Audiometry (BERA), which are ideally performed in the first three days to one month of life.^{1,2}

Indonesia's health profile in 2005 estimated that 214,100 congenital deafness occurred in 214.1 million Indonesian citizens, and this number is increasing every year due to the high birth rate of 0.22%.³ Congenital deafness can be caused by genetic, environmental, and the interaction of these two factors. Genetic factors play about 50-75% as a cause of hearing loss. Hearing loss related to genetic factors/ Congenital Hearing Loss (CHL) can be found in two forms, namely: Syndrome Hearing Loss (SHL) and Non-Syndromic Hearing Loss (NSHL).⁴

Thirty percent of congenital hearing loss is syndromic with abnormalities in other organ systems, and 70% is non-syndromic. To date, approximately 600 GPS-related syndromes have been identified, including Usher, Pandred, Stickler, Branchio-oto-renal, Down's syndromes, etc.² Based on data from the hereditary hearing loss homepage, there are 123 genes that cause GPNS; 51 autosomal dominant (DFNA); 77 autosomal recessive (DFNB); and 5 X-chromosome (DFNX).⁴

The aim of this study is to initiate the genetic hearing loss screening in Surabaya, to knowing the prevalence of genetic hearing loss in Surabaya special school, identify the gene mutation for providing the next genetic

mapping in Indonesia and identify the gene mutation in family (pedigree). The benefit of the study is significance for hearing loss screening (Diagnose on a molecular basis can early predict hearing loss disability, detect genetic mutation which may lead to congenital deafness, hearing loss pattern and post-lingual hearing loss disability, the earlier detected, the earlier treated and intervention provide newborns babies of hearing impairment with timely and appropriate intervention services and also to knowing the risk analysis before pregnancy.

2. MATERIAL AND METHODS

The participants of this study were students of Deaf School in Surabaya Indonesia. Inclusion criteria are children with congenital hearing loss, profound SNHL (>80 dB). Exclusion criteria are having a history of head trauma, otological disease, meningitis, rubella virus infection, and using ototoxic drugs. Participant's parents who are willing to follow the research in advance fill out informed consent sheets. Medical history and pedigree information were obtained by a questionnaire.

This research was conducted ethical review (No. 243/EC/KEPK/FKUA/2020) Faculty of Medicine Universitas Airlangga on Okt, 1 2020. Ethical exemption was approved by Health Research Ethics Committee Fac. Of Medicine Airlangga University Declared to be ethically appropriate in fulfillment of the standard indication. The design of the research are observational, cross sectional, and randomized Study. The sample was examine by otoscopy and pure-tone audiometry. Blood samples were obtained and DNA was extracted from 5 ml blood using standard procedures.

DNA samples are amplified with biotin-marked primers by PCR. Attach amino oligo modified DNA probe onto low-density nylon HybriMem. Single stranded DNA sample anneal to complementary DNA probe on HybriMem. Optimized condition will only leave completely hybridized double stranded hybrids. Enzyme-conjugates attached onto biotin-marked DNA sample. The conjugation turns to a blue spot when

substrate (NBT+BCIP) is added. The hybrid hearing loss susceptibility kit has advantage such as high specificity and accuracy, simple operation, high efficiency, and whole process for 3 hours with hands-on time only 1 hour.

3. RESULT

There is 49 children met the criteria were included from total group 160 children in deaf school with high amount from junior high school – B for about 40 students. From the 49 children we found 3 genetic mutation (PDS or SLC26A4, GJB or connexin 26 and mRNA or MTRNR1 gene mutation).

4. DISCUSSION

Hearing impairment is one of the most common sensory defects. It affects approximately 1 in 1000 newborns worldwide and about 4% of people less than 45 years of age have some form of hearing loss. Hereditary hearing loss can be classified into syndromic and non syndromic hearing loss. Non syndromic hearing loss (NSHL) can be inherited in an autosomal recessive manner (75–80%), autosomal dominant pattern (20–25%) or rare instances as an X linked or mitochondrial pattern of inheritance (1–2%).⁵

Mutation of the GJB2 gene is the main cause of congenital deafness. About 50% of GJB2 gene mutations cause autosomal recessive nonsyndromic hearing loss in the world. In Turkey, about 18.9% of hearing loss patients are caused by GJB2 gene mutations.⁶

5. CONCLUSION

Genetic/ congenital hearing loss is found in two forms, namely syndromic and non-syndromic. Gene mutations are the main cause of hearing loss that occurs in the structures of the inner ear, causing sensorineural hearing loss. Autosomal recessive mutations in the GJB2/connexin 26 gene are common in nonsyndromic hearing loss. The genetic hearing loss screening has been initiated in students of Deaf school in Surabaya. The prevalence was found in 3 (6,1 %) students from total 49 students. Mutation variant of genetic Hearing Loss was detected in each 3 children in school, included the most prevalence variants : GJB2, SLC26A4, dan 12 SRNA mitokondria. Genetic exam is important to provide a definitive diagnosis, early identifying syndromic/nonsyndromic deafness before the onset of other manifestations, estimating the risk of recurrence in family members, reducing the number of repeat audiological tests or additional tests for sensorineural hearing loss, and treatment options as well as outcomes.

ACKNOWLEDGMENTS

Identify the gene mutation in family (pedigree) Identify the gene mutation for providing the next genetic mapping in Indonesia

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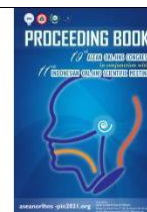


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THE ROLE OF EARLY RADIOFREQUENCY TURBinate REDUCTION ON REMODELLING IN PERSISTENT ALLERGIC RHINITIS

Nina Irawati^{1*}, Lisnawati², Diar Riyanti¹

¹Department of Otorhinolaryngology Head and Neck Surgery, Faculty of Medicine Universitas Indonesia – Cipto Mangunkusumo Hospital, Jakarta, Indonesia

²Department of Anatomical Pathology, Faculty of Medicine Universitas Indonesia – Cipto Mangunkusumo Hospital, Jakarta, Indonesia

Abstract

Introduction: Allergic rhinitis (AR) is a chronic inflammatory nasal disease affecting 10–30% world population. Nasal obstruction was found in 70% of moderate-severe persistent AR. Radiofrequency turbinate reduction given as an initial treatment prior to pharmacotherapy was expected to control inflammation and lead to physiological mucosal remodelling.

Objective: To evaluate the effectiveness of radiofrequency turbinate reduction on remodelling process in moderate-severe persistent allergic rhinitis.

Methods: A total of 32 patients diagnosed with moderate-severe persistent allergic rhinitis were randomised into radiofrequency group and control group. Radiofrequency group received radiofrequency procedure followed by antihistamine H-1 and intranasal steroid, while control group only received antihistamine H-1 and intranasal steroid. Remodelling markers were further evaluated in this study before and after the treatment by performing nasal biopsy and immunohistochemical staining using matrix metalloproteinase-9 (MMP-9), tissue inhibitor metalloproteinase-1 (TIMP-1), and plasminogen activator inhibitor (PAI-1).

Results: The ratio of MMP-9/TIMP-1 decreased significantly in intervention group (independent t-test, $p < 0.05$). PAI-1 expression increased in both group, but no statistically significant difference were found.

Conclusion: Radiofrequency given as initial treatment would be beneficial to control inflammatory in allergic rhinitis, which then lead to physiological mucosal remodelling. Therefore, it can promote drug absorption and reduce the use of long term pharmacotherapy.

Article Info

Keywords:

allergic rhinitis radiofrequency turbinate reduction, mucosal remodelling

*Corresponding author:

Address: Pancoran Indah II E4 No.16, Komplek Liga Mas, Jakarta Selatan, DKI Jakarta, 12760, Indonesia

e-mail: ninairawati.sgt@gmail.com

1. INTRODUCTION

Allergic rhinitis (AR) is a chronic inflammatory nasal disease affecting 10–30% world population.^{1,2} It is a chronic symptomatic disorder of the nose induced by IgE-mediated inflammation, characterized by rhinorrhea nasal obstruction, itching, and sneezing, after allergen exposure of the nasal mucous membrane.^{3,4} It becomes a major health problem impacting quality of life, work/school performance and productivity, sleep-disordered breathing, medical costs and its association with asthma.⁵⁻⁹ Department of Otorhinolaryngology in Cipto Mangunkusumo Hospital, Jakarta reported that there was 62 patient (37%) out of 291 new visits diagnosed with moderate-severe persistent allergic rhinitis and 68% of them complained of uncontrolled nasal congestion with visual analog scale (VAS) ≥ 5 from January to December 2017.

World Health Organization-Allergy and Its Impact on Asthma (WHO-ARIA) recommends oral antihistamine and intranasal steroid as the treatment of choice for persistent moderate-severe allergic rhinitis. Intranasal steroid is the most effective choice in treating allergic rhinitis symptoms, including nasal congestion. Nasal congestion caused by edema of the inferior turbinate and/or turbinate hypertrophy may inhibit intranasal steroid absorption. Therefore, turbinate reduction procedure is needed. Various turbinate reduction procedures can be performed.¹⁰⁻¹³ Previous study was performed to evaluate the radiofrequency procedure after the pharmacological therapy who failed to control the symptom.¹⁰ There is no study to assess the effect of early turbinate reduction procedure, such as radiofrequency prior to the pharmacological treatment.

Radiofrequency reduction of the inferior turbinate is a minimally invasive office procedure using low energy (2-10W) and set time (10 seconds) with heat of 60-900C and energy of 460kHz. This technique effectively reduces the volume of submucosal stromal tissue while maintaining respiratory epithelium, and has the effect of eliminating long-term nasal symptoms.¹⁰ Subsequent to the technique, there are scar tissue

formation in the submucosa, obliteration of the veins, destruction of the gland, inhibition of local immune responses, interference in neurogenic inflammation, reduce inflammatory cells, reduce hyperreactivity of the nasal mucosa and chemical mediators in late-phase allergic reactions. This will increase nasal patency and maintain laminar air flow.^{10,13}

Currently, the effect of radiofrequency on epithelial remodelling is still unknown. We hypothesized that early radiofrequency would have effect on inflammatory reaction which further lead to physiological remodelling.

2. MATERIAL AND METHODS

This study was conducted from July 2018 to February 2020. Patients diagnosed with moderate-severe persistent allergic rhinitis based on history, physical examination and skin prick examination were included in this study. A total of 32 patients aged 18-55 years old were recruited. All patients were given written consent and willing to participate. Patients who had comorbidities such as septum deviation, pregnancy, severe systemic disease, acute rhinitis or rhinosinusitis, nasal polyp, nasal or paranasal tumour, or coagulation disorder, smokers and those who previously received turbinate reduction or other nasal procedure were excluded. Patients were assigned into two groups using single-blind block randomization. The radiofrequency group received radiofrequency turbinate reduction followed by antihistamine H-1 and intranasal steroid. Meanwhile, the control group received the standard treatment of antihistamine H-1 and intranasal steroid.

PAI-1, MMP-9, and TIMP-1 as remodelling component were evaluated using immunohistochemistry. The tissue biopsy was obtained through a cunam biopsy from the inferior turbinate. The tissue specimen was then placed in a formalin buffer solution of 10% and delivered to the Department of Pathology and Anatomy for immunohistochemistry evaluation. The bleeding was controlled by placing an anterior tamponade consist of in lidocaine adrenalin 1:5000. Immunohistochemistry staining

was carried out using primary antibody from Abcam, Cambridge anti-TIMP-1 antibody [2A5] ab2464, diluted 1:100, overnight; anti-MMP-9 antibody [5G3] ab119906, diluted 1:400, overnight; and anti-PAI1 antibody ab66705, diluted 1:300, overnight. A tissue biopsy of the inferior turbinate were obtained before and after the treatment (4 weeks).

The intensity of immunostaining for MMP-9 and TIMP-1 was determined using Can et al.14 criteria, where 1(+) means 25% staining in the epithelial surface, 2(+) means 25-50% staining in the epithelial surface, endovascular, perivascular, and vascular basal membrane, 3(+) means 2(+) and 50-75% staining in the inflammatory cells, and 4(+) means 3(+) and 75-100% staining in the matrix. Immunoreactivity index for PAI-1 was count for its positivity and intensity using ImageJTM program by counting the number of positive and negative inflammatory cells using immunohistochemistry staining in five different fields of view with 400x magnification. Then, the percentage of inflammatory cells positivity was determined by dividing the number of positive inflammatory cells by the total number of inflammatory cells. Radiofrequency turbinate reduction were performed using local anaesthesia by applying a cotton soaked in lidocaine adrenaline 1:5000 titration and added with xylocaine gel for 10 minutes for both nostrils. Then, the inferior turbinates in both nostrils were infiltrated by a mixture of 1 mL of lidocaine 2% and 2 mL of sodium chloride 0.9% . The radiofrequency probe Sutter was inserted to the distal end of the inferior turbinate until the black line from the probe was inside the inferior turbinate (approximately 10-12 mm). Radiofrequency turbinate reduction was performed for 10 seconds with heat of 60-900C and energy of 460kHz. The probe were inserted in two to three sites of inferior turbinate. Patients were observed for 10 minutes after the procedure. If bleeding occurred, an anterior tamponade for the nostrils with Netcell® was applied for 48 hours.

Antihistamine H-1 and intranasal steroid were given based on Allergic Rhinitis and its Impact on Asthma (ARIA) WHO 2008 guideline. ⁵ Fluticasone furoate was administered twice daily in two sprays (100 µg) for each nostrils within two weeks. Then, the dose was reduced to once daily using two sprays (100 µg). Antihistamine H-1 was given in a dose of 10 mg, once daily. Pharmacological treatment was given for four weeks, and then intranasal steroid was continued for another four weeks.

3. RESULT

All 135 student participated in this study were assess their wudu activity and fulfill questionnaire about SFAR, history of infection and identity. The percentage of male student was 36.3 % and 63.7 % female, it because of majority student were female. Perfect istinsyaq and istitsar activity perform by 25.9 % and 24.5 as showed in table 1.

Table 1. PAI-1 immunohistochemistry expression in persistent allergic rhinitis

Immunohistochemistry staining (Mean ± SD)	Radiofrequency group (n = 13)	Control group (n = 16)	P value
Before treatment	0,62 ± 0,14	0,61 ± 0,14	0,972a
After treatment	0,69 ± 0,17	0,66 ± 0,17	0,714a
Delta PAI-1	0,08 ± 0,26	0,11 ± 0,24	0,775a
%Delta PAI-1	2,18 ± 52,19%	8,93 ± 49,49%	0,945a
Comparison PAI-1 within group before and after treatment	0,263b	0,345c	

aIndependent T-test; bDependent T-test; cWilcoxon test

In this study, immunohistochemistry was performed to evaluate the expression of MMP-9 and TIMP-1 before and 4 weeks after the intervention. Immunohistochemistry staining of MMP-9 showed that MMP- 9 was mostly expressed in epithelial cells, glandular, inflammatory cells, and rarely seen in the matrix. Hence, the MMP-9 positivity value varied from 1(+) to 4(+). The expression of MMP-9 can be seen on Picture 1.

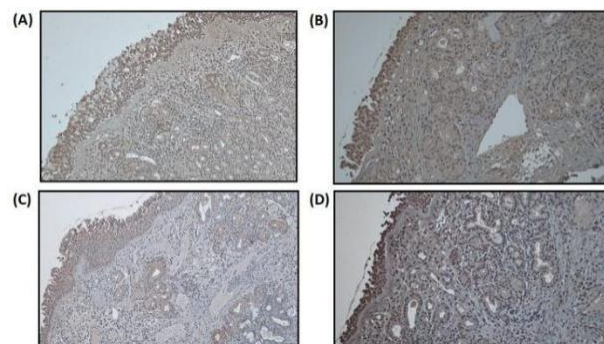
TIMP-1 expression using immunohistochemistry staining could be observed in epithelial, glandular, inflammatory cells, perivascular, endovascular, inflammatory cells and matrix with positivity values 2(+) to 4(+). The TIMP-1 immunohistochemistry expression can be seen in Picture 2.

Table 2. MMP-9 and TIMP-1 immunohistochemistry expression in persistent allergic rhinitis

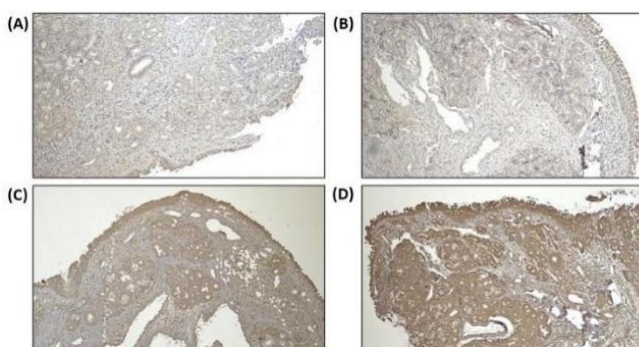
Immunohistochemistry staining (Mean ± SD)	Radiofrequency group (n = 13)	Control group (n = 16)	P value
MMP-9*			
Before treatment	2 (2-3)	2 (1-2)	0,015a
After treatment	1 (1-1,75)	2 (2-3)	0,001a
Delta MMP-9*	-0,375 (-0,5 - -0,167)	1 (-0,5-1,5)	0,000a
%Delta MMP-9*	-50% (-67-0%)	50% (-50-200%)	0,000a
TIMP-1*			
Before treatment	3 (3-3,75)	3 (2,5-3)	0,107a
After treatment	3 (2-4)	4 (2-4)	0,037a
Delta TIMP-1*	0 (-1-0,75)	1 (0,5-1,5)	0,005a
%Delta TIMP-1*	0 (-33-50%)	33% (-25-100%)	0,006a
Delta MMP-9/TIMP-1 ratio**	-0,302 ± 0,29	-0,006 ± 0,35	0,016b
Comparison PAI-1 within group before and after treatment	0,008c	0,753c	

*Median (Interquartile range), **Mean ± SD aMann-Whitney test; bIndependent t-test; cWilcoxon test

The reduction of MMP-9 was significantly lower in the intervention group compared to the control group. On the other hand, TIMP-1 increased was significantly higher in the control group compared to the radiofrequency group. Reduction of the MMP-9/TIMP-1 ratio was more in the intervention group compared to the control group (p < 0.05). The expression of MMP-9 and TIMP-1 before and after treatment can be seen in Figure 1 and Figure 2, respectively.



Picture 1. Immunoreactivity of MMP-9 expression. Radiofrequency group at initial (A), control group at initial (B), radiofrequency group during follow up 4 weeks (C), control group during follow-up (4 weeks) (D)



Picture 2. Immunoreactivity of TIMP-1 expression. Radiofrequency group at initial (A), control group at initial (B), radiofrequency group during follow up 4 weeks (C), control group during follow-up (4 weeks) (D)

4. DISCUSSION

This is the first study to evaluate the effect of radiofrequency on nasal mucosal remodelling. Both groups in this study showed an increase in PAI-1 expression in week 4 after treatment, yet the increment of PAI-1 in both groups was < 10%; therefore, it was not clinically important. Additionally, no significant difference of PAI-1 expression in both treatment groups. A slight increase in PAI-1 expression was necessary to

create the fibrin deposition and restore the epithelial barrier in allergic rhinitis.

A significant reduction of MMP-9/TIMP-1 ratio was clearly seen in the intervention group compared to the control group. These results were in accordance with previous research by Kyo et al.¹⁵ which stated that there was a noteworthy elevation in TIMP-1 expression in the nasal mucosa after topical corticosteroids administration. High TIMP-1 level inhibit MMP-9 expression, thereby reduces the symptoms by controlling inflammatory reaction and leads to physiological remodelling. Besides inhibiting MMP-9 expression, TIMP-1 also plays a role in reducing the migration of inflammatory cells by inhibiting ICAM-1 and VCAM-1 expression, which is high in allergic rhinitis patients¹⁵. Within-group analysis showed that the reduction of the MMP-9/TIMP-1 ratio was significant only in the intervention group and was not found in the control group. This finding suggests that early radiofrequency treatment has a role in preventing pathological remodelling in moderate-severe persistent allergic rhinitis.

5. CONCLUSION

Radiofrequency given as initial treatment for allergic rhinitis played an important role in controlling inflammatory and lead to physiological remodelling. As a result, it can repair the epithelial barrier which can enhance drug absorption and most importantly reduce the use of pharmacotherapy in long term.

ACKNOWLEDGMENT

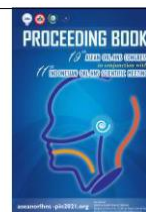
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THE ROLE OF PLATELET RICH FIBRIN (PRF) FOR WOUND HEALING AND PLASTIC RECONSTRUCTION

Mirta Hedyati Reksodiputro

Facial Plastic Reconstructive Division, Department of Otorhinolaryngology-Head and Neck Surgery, Faculty of Medicine, University of Indonesia, Cipto Mangunkusumo Hospital Jakarta, Indonesia.

Abstract

Introduction: PRF or PRFM is a new generation platelet product consisting of a three-dimensional fibrin matrix. This biomaterial can be utilized to improve wound healing and outcome of plastic reconstruction procedures.

Clinical Applications: The biomaterial had proven its uses in improving wound healing, facial plastic surgery (nasolabial fold, atrophic acne scar, and to reduce ecchymosis after rhinoplasty), in fat grafting and skin grafting procedures.

Discussion: PRF or PRFM is a development of PRP with a different, robust physical form that may have additional advantages in different clinical conditions. The three-dimensional fibrin matrix in PRFM entraps thrombocyte and growth factors, resulting in the gradual release of growth factors to the wound site over time. There are many available commercial kits, but modification of PRFM preparation methods are present to ensure easier access to this biomaterial.

Conclusion: PRFM is a bioproduct developed from PRP with potential to improve wound healing and outcome of reconstructive procedures. Further utilization of PRFM and development could benefit the patients and medical society.

Article Info

Keywords:

plastic reconstruction, PRF, wound healing

*Corresponding author:

Facial Plastic Reconstructive Division,
Department of ENT, Faculty of Medicine,
University of Indonesia, Cipto Mangunkusumo
Hospital

Jalan Pangeran Diponegoro No. 71, Kenari,
Senen, Jakarta Pusat, Indonesia, 10430.
email: citamirta@yahoo.com

1. INTRODUCTION

Tissue engineering is the combination of cell, scaffold, and growth factors used to promote tissue regeneration. The recent development of tissue engineering has created numerous biological products that can help accelerate wound healing. The development of biological products that can be used in everyday clinical situations will significantly affect the prognosis of surgery, especially for facial plastic reconstruction.

One of the bioproduct development is platelet-rich fibrin (PRF) or platelet-rich fibrin matrix (PRFM), which is a platelet-derived product. Before PRFM, platelet-rich plasma (PRP) was more commonly used in the clinical setting, it is a concentrate of autologous platelets as a source of growth factors, but the use of PRP has several drawbacks, such as the liquid or gel consistency that causes the product to dissolve in surgical sites. Furthermore, the growth factor is usually released abruptly within the first two days of injection.^{1,2}

PRFM is a new generation platelet product consisting of a three-dimensional fibrin matrix. It is macroscopically denser and more elastic. The fibrin matrix entraps thrombocyte and growth factors, resulting in the gradual release of growth factors to the wound site over time. Previous studies had shown the use of PRFM in wound healing in which concluded that there is an increase in the level of PDGF, VEGF, bFGF, and TGFβ on the first day after application, which gradually decreases the next few days, which is not seen in PRP injection.¹⁻³ This paper will look upon the practical use of PRFM to enhance wound healing and in other plastic reconstruction related procedures.

2. CLINICAL APPLICATION

2.1. Clinical Application of PRFM In Wound Healing

Wound healing is an intricate process consisting of four major steps, hemostasis, inflammation, proliferation, and maturation. PRFM has been continuously used and proven to be effective in helping wound healing in numerous clinical conditions. This knowledge had become the basis of PRFM use to improve healing in numerous surgical procedures.

Plantar ulcer is one of the most common complications of diabetes

and Hansen's disease, thus healing of this ulcer had been thoroughly looked upon. Various modalities have been used to treat ulcers, including moist dressing, vacuum closure, and hyperbaric oxygen therapy. Recent literature shows PRFM effectiveness in the treatment of non-healing chronic ulcers. PRFM can be used as an inexpensive treatment option for chronic ulcers.

Kartika et al.⁴ did a randomized control trial of diabetic foot ulcers at two hospitals in Jakarta. Thirty subjects were recruited and randomized into PRF, PRF + hyaluronic acid, and control groups. Treatment was administered at baseline, day 3, day 7, and day 14. The ulcer was examined using digital imaging, and the biomarker was analyzed using the ELISA method from wound swab specimens. PRF + hyaluronic acid group shows no significant increase in wound area compared with PRF group; on the other side, control group shows a significant increase in granulation area compared to other groups.^{4,5} Wound swab's IL-6 level was significantly lower on day 7, and VEGF was significantly higher on days 3 and 7 in PRF - hyaluronic acid group compared to other groups.⁴

A study by Nagaraju et al.⁶ used 10 ml of venous blood, centrifuged at 3000rpm for ten minutes in a sterile tube without anticoagulant. The PRFM layer was separated, transferred onto sterile gauze, and applied to Hansen's foot ulcer disease. After five days, the PRFM was removed, and the ulcer was assessed for its area and volume. The procedure was repeated every week. In seven patients, all ulcers show improvement with mean area improvement of 93.52% and volume improvement of 97.74%.⁶

2.2. Clinical Application of PRFM in Facial Plastic Surgery

According to Sclafani⁷, PRFM has been used in several settings of facial plastic surgery, including minimally invasive therapy and intraoperative use. PRFM injected into nasolabial fold has been shown to yield significant improvements within 2 weeks. PRFM can also be used to treat atrophic acne scars. PRFM can be mixed with autologous fat and then injected as autologous fat transfer. For intraoperative use PRFM can be injected after lateral osteotomies to reduce ecchymosis after rhinoplasty.⁷

2.3. Clinical Application of PRFM and Fat Graft

Vocal cord paralysis causes dysphonia, which interrupts communication and interaction. Use of PRFM with autologous fat tissue in injection laryngoplasty can be used to treat this condition. Autologous fat is one of the best fillers used in this procedure since it is highly absorbable into body tissues.⁸ PRFM used involved in this part can improve fat viability by increasing angiogenesis and adipogenesis. This application will result in the fat graft improving clinical outcomes of laryngoplasty while reducing the risk of repeated procedures. Adipose tissue stem cells (ASC) in fat graft secrete growth factors and cytokines that increase vascularization and slow down immune response.⁹ PRFM is an advanced form of Platelet Rich Plasma (PRP) which contain a high concentration of platelet, fibrin formation, and slower release of growth factor. PRFM will work synergistically with fat graft.¹⁰ This fat graft was harvested from abdominal fat and removed with scissors. The fat was cleaned and sheared into microlobular form, while PRF was made by taking 10 mL peripheral blood and centrifuged and mixed with a fat graft to create filler for injection.¹¹ A single-blinded randomized control trial conducted by Reksodiputro et al.¹¹ showed that a combination of PRF and fat graft in injection laryngoplasty have the potential in enhancing fat viability and improve quality of life, which is clinically significant, but not statistically significant with the control group (which received fat tissue graft only).¹¹

2.4. Clinical Application of PRFM in Skin Graft

A study conducted by Reksodiputro et al.¹² showed that PRFM helped healing in Full-Thickness Skin Grafts (FTSG). This study used a porcine skin graft harvested from the back of the pig. After harvesting, grafts were reimplanted to their original location with or without PRFM application. PRFM was applied at the centre of the bed underneath the skin graft. The graft was fixated by tight over suture for 7 days post-surgery. Subsequent punch biopsy was then conducted to obtain samples for macroscopic (skin colour), extracellular matrix (collagen), microscopic (PMN, macrophage, and fibroblast) and ELISA (TGFβ1 and PDGF) analysis to determine the level of wound healing activity. This study observed that PRFM and PRP, as autologous platelet preparation, accelerate wound healing in FTSG, with PRFM deemed superior due to the higher number of PMN, macrophage, and fibroblast.¹²

3. DISCUSSION

In terms of choices of biomaterials, the obvious questions were a comparison between PRP and PRFM for wound healing. As with the creation of PRFM, currently, there are multiple methods and commercial kits available for the preparation of PRP. Most of this method will produce a product in liquid or gel form. Due to these physical properties, conventional PRP is often impractical in clinical settings that require secure implantation in a specific site or where released growth factors could be washed out during an operation.

PRFM was created as a development of PRP through alteration of its physical property achieved by plasma and platelet stimulation. Calcium (CaCl₂) and centrifugation were added to PRP in order to produce PRFM without the need for additional exogenous thrombin. The addition of CaCl₂ and centrifugation will convert fibrinogen to fibrin and cause the fibrin cross-links to form a matrix that contains viable platelets.¹³ The resulting PRFM is a solid thin sheet with a more robust physical structure than the liquid PRP. Observation using SEM found high concentrations of non-activated, functional, intact platelets within the PRFM's fibrin matrix.

These platelets in PRFM had been proven to release a relatively constant concentration of growth factors over 7 days, compared to PRP where the release of growth factor from thrombocyte occurs at once in the beginning of application. The PRFM can replicate the effect of a natural wound healing response (i.e., the three-dimensional formation of a cross-linked fibrin matrix). This scaffold-like fibrin matrix is essential as a place for platelet adhesion. This scaffolding helps localize platelets and ultimately increases the concentration of growth factors to the desired point or location for tissue regeneration.¹⁴

As had been previously mentioned, PRFM can be made through centrifugation of PRP and addition of CaCl₂, however the exact time of centrifugation and amount of CaCl₂ to produce ideal PRFM is challenging. Commercial kits for preparing PRFM had been available and

widely used in clinical settings. One such example is the FIBRINET tubes which can produce PRFM from whole blood.² However, the use of the aforementioned commercial tools has several drawbacks, including (1) High prices, rendering the use of PRFM in a clinical setting to be economically dubious; (2) concentration of platelet in PRFM is unknown, increasing the possibility of not achieving the creation of ideal PRFM.

In order to overcome these problems, Reksodiputro et al.¹⁵ proposed to overcome the problems mentioned above and cover the weaknesses of the existing invention through a modified method to produce PRFM. The proposed modified method showed that mixing PRP with 25 mM of 1M CaCl₂ and centrifuging at a speed of 2264 G for 25 minutes at room temperature can reliably produce ideal PRFM comparable in quality to the commercial kit.¹⁵ This finding helps ease accessibility to use PRFM in countries where there's limited availability to commercial kit, further increasing the chance that patients can get the full benefits of PRFM.

Even though numerous studies have been made regarding the use of PRFM, its utilities have not been maximized. A recent, ongoing study in our center had been conducted to look upon the possibility of using PRFM to prevent resorption of cartilage graft, especially in microtia patients after Nagata procedures.¹⁶ The result of that study has a potential to significantly increase patient's quality of life and reduce the burden from re-operation. The author of this paper hoped and invite fellow clinicians to conduct more research surrounding the use and development of PRFM to improve healthcare for patients around the world.

4. CONCLUSION

PRFM is a bioproduct developed from PRP with proven potential to improve wound healing and outcome of numerous reconstructive procedures. Its further utilization and development could benefit the patients and medical society.

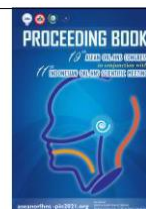
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MEDICATION HISTORY OF MOTHERS WHOSE CHILDREN HAD CONGENITAL HEARING LOSS DURING PREGNANCY: A SURVEY STUDY

Indra Zachreini¹, Jenny Bashiruddin², Semiramis Zizlavsky², Susyana Tamin², Harim Priyono², Ika Dewi Mayangsari², Respati Ranakusuma³, Natasha Supartono², Widayat Alviadi², Heditya Damayanti⁴, Dina Alia⁵, Tengku Siti Hajar Haryuna⁶, Juliandi Harahap⁷, Nirza Wanto⁸, Hidayatul Fitria⁹, Beni Hidayat¹⁰, Abila Ghanie¹¹, Ahmad Hifni¹¹, Muslim Kasim¹², Gustav Syukrinto¹³, Ratna Anggraeni¹⁴, Lina Lasminingrum¹⁴, Muyassaroh¹⁵, Novi Primadewi¹⁶, Muhammad Arif Purwanta¹⁷, Ashadi Prasetyo¹⁸, Sagung Rai Indrasari¹⁸, Mahatma Bawono¹⁹, Nyilo Purnami²⁰, Dyah Indrasworo²¹, Suardana²², Eka Putra Setiawan²², Putu Dian Ariyanti Putri²², Komang Andi Dwi Saputra²¹, Made Lely Rahayu²¹, I Made Wiranadha²¹, Arman Amar²³, Eva Nurfaridah²⁴, Eka Savitri²⁵, Tjandra Manukbua²⁶, Steward Keneddy Mengko²⁷, Augustien Yuliet Tamus²⁷

¹Department of Otorhinolaryngology Head and Neck Surgery (ORL-HNS), Faculty of Medicine Universitas Malikussaleh/ Cut Meutia Hospital North Aceh Utara

²Department of ORL-HNS, Faculty of Medicine Universitas Indonesia/Dr. Cipto Mangunkusumo Hospital Jakarta

³Clinical Epidemiology and Evidence-Based Medicine Unit, Dr. Cipto Mangunkusumo Hospital Jakarta/ Faculty of Medicine Universitas Indonesia

⁴Department of ORL-HNS, Fatmawati Hospital Jakarta

⁵Department of ORL-HNS, Faculty of Medicine Faculty of Universitas Syiah Kuala/Dr. Zainoel Abidin Hospital Banda Aceh

⁶Department of ORL-HNS, Faculty of Medicine Faculty of Universitas Sumatera Utara /H. Adam Malik Hospital Medan

⁷Department of Community Medicine, Faculty of Medicine Faculty of Universitas Sumatera Utara

⁸Department of ORL-HNS, Faculty of Medicine Faculty of Universitas Andalas/M. Jamil Hospital Padang

⁹Department of ORL-HNS, Awal Bross Hospital Pekanbaru

¹⁰Department of ORL-HNS, Eka Hospital Pekanbaru

¹¹Department of ORL-HNS, Faculty of Medicine Faculty of Universitas Sriwijaya/M. Husin Hospital Palembang

¹²Department of ORL-HNS, Mitra Husada Pringsewu Hospital Lampung

¹³Department of ORL-HNS, Kota Tangerang Hospital

¹⁴Department of ORL-HNS, Faculty of Medicine Faculty of Universitas Padjadjaran/Dr. Hasan Sadikin Hospital Bandung

¹⁵Department of ORL-HNS, Faculty of Medicine Faculty of Universitas Diponegoro/Dr. Kariadi Hospital Semarang

¹⁶Department of ORL-HNS, Faculty of Medicine Faculty of Universitas Solo/Dr. Mawardi Hospital Solo

¹⁷Department of ORL-HNS, Dr. Soeradji Tirtonegoro Hospital Klaten

¹⁸Department of ORL-HNS, Faculty of Medicine Faculty of Universitas Gajah Mada/ Dr. Sardjito Hospital Yogyakarta

¹⁹Department of ORL-HNS, Faculty of Medicine Faculty of Universitas Gajah Mada/Akademik Hospital UGM

²⁰Department of ORL-HNS, Faculty of Medicine Faculty of Universitas Airlangga/ Dr. Sutomo Hospital Surabaya

²¹Department of ORL-HNS, Faculty of Medicine Faculty of Universitas Brawijaya/ Dr. Saiful Anwar Hospital Malang

²²Department of ORL-HNS, Faculty of Medicine Faculty of Universitas Udayana/ Sanglah Hospital Denpasar

²³Department of ORL-HNS, Panglima Sebaya Hospital Tanah Grogot

²⁴Department of ORL-HNS, Faculty of Medicine Faculty of Universitas Tanjung Pura/Sultan Syarif Mohamad Alkadri Hospital Pontianak

²⁵Department of ORL-HNS, Faculty of Medicine Faculty of Universitas Hasanudin/Dr. Wahidin Sudirohusodo Hospital Makassar

²⁶Department of ORL-HNS, Lakipadada Hospital, Makale, Tana Toraja

²⁷Department of ORL-HNS, Kandou Hospital Manado

Abstract

Background :A high prevalence of congenital hearing loss in Indonesia indicates the requirement of a study identifying potential maternal risk commonly associated with congenital hearing loss.

Objective: To identify history of medicine use during pregnancy of mothers whose children with congenital hearing loss.

Methods: A cross-sectional study using a questionnaire collected during an interview was conducted retrospectively. Based on our sample size calculation and quota sampling methods, we included 535 mothers who had children with congenital hearing loss visiting 24 hospitals across 17 provinces in Indonesia.

Results: Most of the respondents are middle-aged women at between the age of 30 and 39 years old (55%) with the age average of 34.1 year. Most of them were housewives (71.8%) and had a high school education (52.5%). Out of 535 respondents, 68 women (12.7%) took medicine during pregnancy which mostly were analgesics (6.9%), followed by anti-hypertension medicine (3.2%) and herbals (1.5%).

Conclusion: Most mothers who had children with congenital hearing loss have taken analgesics during their pregnancy. A high-quality cohort study assessing history of medication use during pregnancy and other potential factors as risks for congenital hearing loss is required.

Article Info

Keywords:

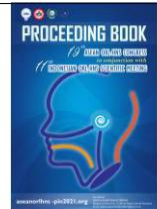
congenital hearing loss, pregnancy, medication

*Corresponding author:

Address: Department of Otorhinolaryngology
Head and Neck Surgery Faculty of Medicine
Universitas Malikussaleh – Cut Meutia Hospital
North Aceh
Jln. Medan Banda Aceh Km 6 Bukit
Rata Lhokseumawe Aceh
email: indrazachreini@unimal.ac.id



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1. INTRODUCTION

Congenital hearing loss is defined as hearing impairment present at birth due to ear inability to transform mechanical energy from sound vibration to electrical energy in the auditory nervous system. (1) Congenital hearing loss can cause speech impairment and language development affecting children's learning ability and psychosocial skills. (2) The prevalence of hearing loss is estimated at 5% in the world's population or approximately 360 million people, including 32 million children. (2) The prevalence estimates worldwide vary between one to three per live births.

(3) In Indonesia, the 2018 Basic Health Research conducted by the Health Research and Development Agency, Ministry of Health Republic Indonesia demonstrated that the proportion of congenital hearing loss in children aged 24 to 59 months was 0.11%. (4) Whilst, the 2005 Indonesian Health Profile showed that the prevalence of congenital hearing loss was approximately 214,100 people. This number will increase every year with the increase in population due to the high birth rate by 0.22% (5)

Hearing loss in children is caused by several factors, such as genetics, infections during pregnancy (e.g., rubella, Cytomegalovirus), infections during childhood (e.g., meningitis, measles, mumps, chronic suppurative otitis media), conditions at birth (e.g., low birth weight, asphyxia, icterus, congenital ear and auditory nerve malformation, and ototoxic medication use during pregnancy, newborn, and childhood. The prevalence of congenital hearing loss caused by the ototoxic medication use during pregnancy and childhood was 4%. (2)

Ototoxic medication is medication that can damage inner ear bilaterally resulting in hearing loss with or without balance disorder. (6) (7) Hearing loss caused by ototoxic medication may be permanent due to the damage of outer hair cell function. However, the damage may only be reversible if the damage is limited to the marginal cell. Ototoxic medication includes aminoglycoside antibiotics, platinum-based chemotherapy, salicylic acid, antimalarials, and loop diuretics. Risks of developing hearing loss following the ototoxic medication use are the existing hearing loss, complications in the kidneys, or genetic predisposition. (6) We aimed to identify the history of medicine use during pregnancy of mothers who had children with congenital hearing loss. (6)

2. MATERIAL AND METHODS

This was a cross-sectional study conducted from January to December 2020. We retrospectively collected personal information of congenital hearing loss patients in hospitals equipped with Brain Stem Evoked Response Audiometry (BERA) for diagnosing congenital hearing loss. Using these data, we contacted parents of congenital hearing loss patient to arrange an interview by phone. During the interview, we asked questions described in a questionnaire specifically developed for this study, such as: history of antihypertensive, analgesics, herbals, chemotherapy, tuberculosis, cardiovascular and kidney disease medications use the target population was patients with congenital hearing loss in Indonesia, and the accessible population was patients with congenital hearing loss in 24 hospitals in Indonesia which were equipped with BERA examination. For the sample study, we included mothers of patients with congenital hearing loss aged 6 months to pre-marital age diagnosed based on BERA examination and had complete data, including their personal information, in the hospital medical records. We planned to recruit minimum 400 women from 17 prespecified provinces in Indonesia, based on sample size calculation using numbers of patients with congenital hearing loss ($n=214,100$ people) according to the 2005 Indonesian Health Profile and 95% confidence level. We used quota sampling methods by setting 23

respondents to be recruited from each province.

We reported the results with numbers of events with percentage for dichotomous outcomes and means with standard deviation for continuous outcomes. As it was limited to a descriptive study, we did not continue this with formal statistical analysis.

3. RESULT

We had 535 mothers of children with congenital hearing loss who responded and completed the questionnaire by the interview. Table 1 showed that most respondents at the age between the age of 30 and 39 years old (55%) with the age average of 34.1 year. Most of them were housewives (71.8%) and had a high school education (52.5%).

Table 1. Demographic characteristics of mothers whose children had congenital hearing loss

Demographic Characteristics	n (N=535)
Age in years (mean \pm standard deviation)	34,1 \pm 6,409
Age (n, %)	
<20 years	3 (0.6)
20 – 29 years	129 (24.1)
30 – 39 years	295 (55.1)
40 – 49 years	99 (18.5)
>50 years	9 (1.7)
Education (n, %)	
Elementary school or below	42 (7.9)
Junior High School	73 (13.6)
High School	281 (52.5)
Diploma	34 (6.4)
Bachelor	91 (17.0)
Masters	14 (2.6)
Occupation (n, %)	
Housewives	384 (71.8)
Private sector employee	66 (12.3)
Civil servant	34 (6.4)
Female migrant worker	1 (0.2)
Self-employed	50 (9.3)
Medication use during pregnancy (n, %)	68 (12.7)

Out of 535, only 68 respondents (12.7%) took medicine during their pregnancy which mostly were analgesics (6.9%), followed by anti-hypertension medicine (3.2%) and herbals (1.5%) (Table 2).

Table 2. Medication taken by mothers whose children had congenital hearing loss during pregnancy

Medications	N (N=68)
Anti-hypertension	17 (3.2)
Chemotherapy for cancer	1 (0.2)
Chemotherapy for cancer	0 (0)
Heart disease medication	4 (0.7)
Kidney disease medication	0 (0)
Analgesics	37 (6.9)
Anti-malaria	1 (0.2)
Herbals	8 (1.5)

4. DISCUSSION

This study showed that only 12.7% of middle-age women who had children with congenital hearing loss reported they took medicine during their pregnancy, which mostly analgesics. Over 60% of women reported taking analgesics, particularly nonopioid, both prescribed and over-the-counter, during their pregnancy. Unfortunately, more than half of available analgesics was at category C and D for pregnancy in the third trimester. (8) Atmadani et al (2020) reported that 11.7% of pregnant women in Indonesia took at least one dose of analgesics during their pregnancy. (9)

Alsaheed et al (2021) reported that the most common analgesics taken by pregnant women worldwide was acetaminophen followed by the nonsteroidal anti-inflammatory drugs (NSAIDs) (10). Acetaminophen within standard therapeutic doses is considered as the safest analgesics for women during the whole stage of pregnancy. (reference). Whilst NSAIDs is not recommended for pregnant women at 20 weeks or later due to insufficient evidence of teratogenic effects on unborn children in the first semester of pregnancy (11). Ototoxic medication taken during first trimester pregnancy, particularly in sixth and seventh week, could result congenital hearing loss (12). There are more than 600 medications classified as ototoxic (13). The aminoglycosides are broad-spectrum, bactericidal antibiotics potentially associated with congenital hearing loss. These antibiotics are widely used particularly low- and middle-income countries due to low production cost. (14). Other ototoxic medication is cisplatin which can cause sensorineural high-frequency hearing loss, related to the dose, administration methods, and duration of medication.(6)

In this study, we did not identify other potential factors that could increase the risk of congenital hearing loss, both from the maternal and placental factors during the pregnancy, such as genetics and infections. We identified this as one crucial limitation of this study. Other limitation of this study was a recall bias arising from data collected retrospectively. However, this study was the first multicenter study that involved numerous hospitals across 17 provinces in Indonesia.

Due to limitations of this study and the importance of identifying the medication use during pregnancy as a risk for congenital hearing loss, a high- quality cohort study assessing this exposure along with other maternal and placental factors is required.

5. CONCLUSION

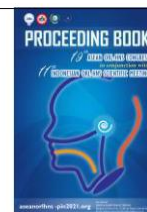
This study demonstrated that most women have taken analgesics during their pregnancy. A high-quality cohort study assessing history of medication use during pregnancy and other potential factors as risks for congenital hearing loss is required.

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TRANSADAPTATION AND VALIDATION OF TINNITUS PRIMARY FUNCTION QUESTIONNAIRE (TPFQ 12 AND TPFQ20) IN INDONESIA LANGUAGE

Nyilo Purnami^{1*}, Nico Probosutejo², Budi Utomo³

¹ Dept of ORL-HNS, Fac. of Medicine Airlangga University/ Dr. Soetomo Academic Hospital, Surabaya, East Java ²Dept of ORL-HNS, Fac. of Medicine Airlangga University/ Dr. Soetomo Academic Hospital, Surabaya, East Java ³Dept of IKM-KP, Fac. of Medicine Airlangga University/ Dr. Soetomo Academic Hospital, Surabaya, East Java

Abstract

Introduction: Tinnitus is the perception of sound, which is not produced intentionally, and the comes from an involuntary way in the owner's head. The questionnaire consists of 20-item and 12-item questions representing 4 independent domains, namely emotion, hearing, sleep and concentration.

Objective: to transadaptation and validity TPFQ-12 and TPFQ-20 in Indonesian which were applied to Tinnitus patients at the URJ Audiology Unit Dr. Soetomo Hospital Surabaya.

Methods: The design of this research is descriptive analytic with crosssectional approach. This research was conducted at the Outpatient Polyclinic. This research was conducted from September 2019 until April 2020. Data was Collected using general ear examination, DPOAE and audiometry as well as filling out a questionnaire.

Results: In the most hearing, hearing was not normal is 27 people (77.2%). Cronbach's Alpha value on item 12 questions is 92% while on item 20 questions is 95%. Based on the correlation coefficient on the TPFQ-12 all significant 0.000 p value <0.01 with a correlation value of $r > 0.6$.

Conclusion: There is no difference between the Tinnitus primary function Questionnaire in question 12 and question 20. Question 12 valid and reliable can be used and represents question 20.

Article Info

Keywords:

transadaptation, validation, TPFQ-12, TPFQ-20

*Corresponding author:

Address: Perum Pandugo, Surabaya, East Java, Indonesia

e-mail: nyilo@fk.unair.ac.id

1. INTRODUCTION

Tinnitus is a common clinical symptom. Tinnitus is the perception of sound, which is not produced intentionally, and that comes from an involuntary way in the owner's head, or it may seem to him to do. This condition is chronically experienced by a large proportion of the population (>15%) and severely debilitates about 1-2% of the population, affecting sleep, concentration, and productivity at work.¹ In many cases of tinnitus can not be eliminated, the best treatment for tinnitus sufferers is how to reduce the impact of tinnitus on the patient. Tinnitus affects the quality of life of sufferers, One of the treatments that can be done is tinnitus counseling and currently several studies have provided counseling via the internet.²

Research from Franke et al (2012) states that 30-40% of the adult population has experienced tinnitus and 0.5-2.5% of them have impaired quality of life.³ World prevalence reports that around 10-20% of the population has experienced tinnitus symptoms.⁴ Tinnitus symptoms occur in almost 61% of the young adult population (Crandell et al., 2004).⁵ A report from the Neurotology division of the audiology section of RSUD DR. Soetomo reported that from 2016-2018 there were 420 patients who came to the Audiology clinic with complaints of tinnitus. Male patients are the most patients with a total of 315 patients compared to women as many as 105 patients where the most patients are at the age of 31-40 as many as 232 patients.

Attempts have been made to establish consensus for patient assessment and outcome measurement.^{6,7,8} However, recent systematic reviews have shown that more than 100 instruments were used for primary outcome measures in clinical trials (Hall et al., 2016).⁹ Several questionnaires are widely used worldwide, including the Tinnitus Handicap Inventory (THI)¹⁰, the Tinnitus Handicap Questionnaire (THQ). However, the THI could not distinguish between sleep disturbances, difficulty concentrating, decreased social enjoyment, and hearing loss. In addition, THI cannot play a role as a guideline in the treatment of tinnitus.¹¹ Recent research has found that the latest questionnaire

developed by Richard Tyler (2014) is valid, reliable, and sensitive and can be used as a tool to measure the quality of life of tinnitus patients. The questionnaire consists of 20-item and 12-item questions representing 4 independent domains, namely emotion, hearing, sleep, and concentration, known as the Tinnitus primary function questionnaire.

The tinnitus primary function questionnaire was previously developed at the University of Iowa and has been translated into various countries such as China and Sweden. This questionnaire has received validation permission and was developed into Indonesian from Prof. Tyler straight away. It is hoped that this questionnaire can be applied and used as a measuring tool for the quality of life of tinnitus sufferers in Indonesia. Therefore, as a first step, research needs to be done to translate the questionnaire into Indonesian and validate it on the patient.

2. MATERIAL AND METHODS

This research is a descriptive analytic study where this study uses a cross sectional research approach where both variables are observed at the same time at the same time. This research was conducted at the Outpatient Clinic (IRJ) audiology RSUD Dr. Soetomo was conducted in September 2019 to April 2020. This study will determine whether the Tinnitus primary function questionnaire which has been developed into Indonesian and is valid to be applied to tinnitus patients in measuring the patient's quality of life.

All research samples will receive treatment: providing information, consent to participate in the study, general ear examination, examination using DPOAE and Audiometry and filling out a questionnaire. The sampling technique was carried out by consecutive sampling that met the inclusion and exclusion criteria. The inclusion criteria in this study were that the patient had unilateral or bilateral tinnitus, had been suffering from tinnitus for 3 months, and was willing to be a respondent. While the exclusion criteria were suffering from hearing loss other than tinnitus, refusing or not attending the scheduled examination.

The data processing and analysis of the questionnaire results for each

factor were tested for validity and reliability using the Cronbach's alpha test ($p > 0.5$ = reliable) with the help of the SPSS program which previously tested the normality of the data first. Different test using Mann Whitney test and T-Test.

3. RESULT

In this study there were 35 respondents who suffered from tinnitus for 3 months. Based on the most age distribution in the age range 17-29 and 60 years and over, namely 8 (22.8%), age 30-39 is 7 (20%), age 40-49 is 6 (17.2%) and age 50-59 which is 6 (17.2%). While the most gender is female, namely 21 people (60%) and 14 people (40%). The highest hearing threshold value (NAD) was at normal and mild degrees, namely 8 people (22.8%), moderate 7 people (20%), moderate-severe 6 people (17.2%), weight 4 people (11.4%), and very heavy 2 people (5.8%). The most hearing was abnormal hearing, namely 27 people (77.2%) while the normal hearing was 8 people (22.8%).

In the results of the questionnaire reliability test, the value of Cronbach's Alpha on the 12 questions item is 92% while the 20 questions item is 95%. Based on the correlation coefficient on the TPFQ-12 all significant 0.000 p value < 0.01 with a correlation value of $r > 0.6$. In Question-1= 0.78; Question-2 = 0.84; Question-3 = 0.86; Question-4= 0.70; Question-5= 0.60; Question-6= 0.61; Question-7= 0.70; Question-8= 0.79; Question-9= 0.68; Question-10= 0.79; Question-11= 0.71; and Question-12=0.74.

Based on the correlation coefficient on the TPFQ-20 all significant 0.000 p value < 0.01 with a correlation value of $r > 0.6$. In Question-1= 0.84; Question-2 = 0.69; Question-3 = 0.70; Question-4= 0.76; Question-5= 0.80; Question-6= 0.74; Question-7= 0.80; Question-8= 0.79; Question-9= 0.81; Question-10= 0.68; Question-11= 0.63; Question-12=0.73; Question-13= 0.77; Question-14= 0.77; Question-15= 0.59; Question-16= 0.70; Question-17= 0.70; Question-18= 0.73; Question-19= 0.68; Question-20= 0.77.

Based on the distribution of the TPFQ questionnaire, there are 4 variables, namely PKONS, PEMS, PPEND, and PTIDR. The average of PKONS20 is 45.2; PEMS 20 is 62.2; PPEND20 is 44.8, and PTIDR 20 is 36.8, while the mean of PKONS12 is 49.1; PEMS 12 is 55.6; PPEND12 is 46.5, and PTIDR 12 is 36.3.

Based on the results of the Mann-Whitney difference test on TPFQ12-TPFQ 20, it was found that all the variables in the questionnaire did not differ between TPFQ12 and TPFQ 20. The concentration variable P12-P20 had a p -value of 0.595, emotion P12-P20 had a p -value of 0.954, Hearing P12-P20 p -value is 0.052, and Sleep P12-P20 p -value is 0.664.

4. DISCUSSION

The Tinnitus Main Function Questionnaire is a new questionnaire (TPFQ) specially designed to evaluate the outcome and effect on tinnitus experienced by patients. In this study, the questionnaire focused on four subcategories, namely emotion, concentration, hearing and sleep. This affects the life of a person in socializing and relaxation. The benefit of the TPFQ is that it provides information about the severity of tinnitus and symptoms experienced, as well as providing information related to several subcategories (concentration, emotion, hearing and sleep scale).

The purpose of this study was to evaluate the reliability and validity of the Tinnitus questionnaire on 20 questions and 12 questions in Indonesian which would later be applied to patients with Tinnitus. The questionnaire consists of 20-item and 12-item questions representing 4 independent domains, namely emotion, hearing, sleep, and concentration, known as the Tinnitus primary function questionnaire. The results of this study showed that the questionnaire on 20 questions and 12 questions was valid and reliable.

The results of this study are comparable with research by Tyler, 2014 that the TPFQ in Indonesian is comparable to the original TPFQ. Cronbach's alpha values range from 0.81 to 0.94 for the original TPFQ, while in this study Cronbach's TPFQ alpha value of 20 questions was 0.95 and in TPFQ 12 questions is 0.93. So it can be concluded from this study that the question 12 tinnitus questionnaire can represent questions 20, as evidenced by the Cronbach's alpha value and the p value of the different test. In this study, there was no difference between item 20 and item 12 questions related to tinnitus.

This is also supported by Chinese research explaining that the 20-item and 12-item versions of the Chinese TPFQ Questionnaire are reliable and valid measures of tinnitus. The TPFQ can be used in the assessment and management of tinnitus among the Chinese-speaking population.¹²

5. CONCLUSION

The questionnaire consists of 20-item and 12-item questions representing 4 independent domains, namely emotion, hearing, sleep, and concentration, known as the Tinnitus primary function questionnaire. There is no difference between the Tinnitus primary function Questionnaire in question 12 and question 20. Question 12 valid and reliable can be used and represents question 20.

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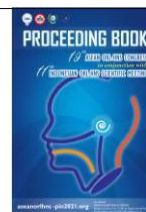
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THE ROLE OF STEM CELL REGULATING T REG CELL IN ALLERGIC RHINITIS

Lia Restimulia

Departement of Otorhinolaryngology-Head and Neck Surgery Faculty of Medicine, Universitas Sumatera Utara

Abstract

Allergic rhinitis (AR) is a condition associated with an IgE-mediated inflammatory response. Mesenchymal stem cells (MSCs) are multipotent stem cells that have immunoregulatory abilities by secreting various cytokines and have the potential as promising therapeutic modalities for allergic airway diseases, including AR. This paper wants to explain further about the mechanism of stem cells in regulating regulatory T cells.

Article Info

Keywords:

allergic rhinitis, stem cell, regulatory T cells

*Corresponding author:

e-mail : restimulia85@gmail.com

1. INTRODUCTION

Allergic rhinitis (AR) is an inflammatory disease of the nasal mucosa caused by allergens via IgE. It has clinical symptoms such as rubbing the nose, sneezing, runny nose, and nasal congestion (1,2). IgE antibodies can trigger mast cell degranulation that releases inflammatory mediators such as histamine, causing early-phase AR inflammation (2-4). Current chemical drugs against AR are limited to antihistamines, anti-leukotrienes, and intranasal corticosteroids, which can relieve allergy symptoms but do not entirely control allergic reactions (7-9). Therefore, it is necessary to develop safer and more effective therapies. On the other hand, MSC has been widely studied as an anti-inflammatory treatment in many diseases related to inflammation and the immune system (1,7,10,11); however, its use in treating AR still requires further research.

The mature form of Dendritic cells as Antigen Presenting Cells with the help of IL-25, IL-33, and TSLP, present antigens to Th0 with MHC class II, and release IL-1, which activates Th0 to proliferate into Th1 and Th2. At the same time, APC produces IL-10, which can control the action of Th2 and regulatory T cells. Dendritic cells play an essential role in allergic rhinitis, with a high efficiency level against Th (Hypponen et al., 2009). In addition, dendritic cells also produce IL-12 to induce interleukin production by Th1. Th0 cells differentiate into Th2 with IL-4 and TSLP, but this process is also controlled by T reg with the help of IL-10 and TGF- β produced by dendritic cells (10).

Th2 cells induce B cells to become plasma cells by producing IL-4, IL-5, and IL-13 along with chemokines, thus producing IgE. This process is also influenced by dendritic cells and NK cells. The binding of IgE to B cells and mast cells occurs through Fc ϵ RI, which is expressed on these cells. In allergy sufferers, Fc ϵ RI is a high-affinity IgE receptor. IgE-Fc ϵ RI complex captures significant allergens that are not phagocytosed by macrophages. Th2 cells also induce mast cells via chemokines and IL-9. Mast cells here degranulate due to the cross-linking process of IgE, and produce histamine (11). In addition, Th2 also produces IL-4, IL-5, IL-9, IL-13, and chemokines which function to stimulate the differentiation and maturation of eosinophils in the bone marrow and help migration into the bloodstream, and subsequently in the nasal mucosa. Interleukin 5 activates eosinophils to release mediator substances such as MBP, ECP, and EPO, PAF, leukotriene, which cause nasal symptoms in the form of runny nose, sneezing, congestion, and nasal itching (12).

Clinical symptoms that arise due to this process include sneezing, runny nose, itchy nose, congestion, and eye symptoms. The allergic process continues 6-12 hours after exposure. It releases chemokines such as tumor necrosis factor- α (TNF- α), mediators such as granulocyte macrophage colony-stimulating factor (GM-CSF), tryptase, and cytokines

such as IL-4, IL-5, and IL-13. The process continues with infiltration and activation of effector cells such as eosinophils, Th cells, and B cells within a few days, causing chronic allergic inflammation. Treg and Th1 cell insufficiency is associated with allergic inflammation involving the Th2 immune response in RA patients (10-12).

Treg cells are the primary key in the allergic pathophysiology of the sensitization phase by suppressing the inflammatory response, and play a role in controlling acquired immunity by suppressing the response of effector T cells, B cells, eosinophils, and mast cells. The immune response of Th1 and Th2 cells is suppressed by the secretion of IL-10 and TGF- β . Treg cells cross communicate with APCs to suppress T cell activation through a direct cell-cell contact mechanism, thereby inducing apoptosis (11-13).

The cluster of differentiation of 25+ Treg cells in AR patients is not perfect. Some evidence related to this is the reduced ability of peripheral blood CD4 + and CD25 + cells to suppress T cell proliferation during pollen season and reduction of FoxP3 gene expression in nasal secretions of RA patients (13).

Stem cell is a self renewing and undifferentiated that can have the potential to differentiate into any organ specific cell, depending on the organ. The ability of mesenchymal stem cells (MSC) to immunoregulate causes MSC to be widely used as a therapy. Mesenchymal stem cell is one of the kind that a multipotent stem cell in the form of spindle-like shape which can be derived from bone marrow, adipose, umbilical cord, dermis, synovial membrane, and gingiva (10-15).

Mesenchymal stem cells secrete TGF- β and IL-10 and, together with TSLP induce Treg cells. Treg cells themselves also secrete TGF- β , which inhibits T cell work and B cell proliferation. Interleukin 10 is also produced by Treg cells as immune system regulatory cytokines that downregulate T cell expression and macrophage activity. Treg cells also secrete IL-35 induced by ILC-2 and Th2 as the primary regulatory cytokines similar to TGF- β . It can directly inhibit Th2, suppressing IL-4 and transcription factor GATA-3 to suppress Th2 proliferation (12-15).

2. CONCLUSION

MSCs increases T reg cells through TGF- β and IL-10. It is expected that research can be continued to find a long term safety, duration of response, the exact doses, and the technical feasibility of such cell-based therapies.

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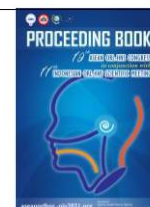
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EFFECTIVENESS OF SUBCUTANEOUS IMMUNOTHERAPY RELATED TO WHO-ARIA GUIDELINE IN KASIH IBU HOSPITAL DENPASAR

Tutwuri Handayani^{1*}, Arif Dermawan²

¹ Department of Otorhinolaryngology Head and Neck Surgery (Kasih Ibu General Hospital, Denpasar, Indonesia)

² Department of Otorhinolaryngology Head and Neck Surgery (Universitas Padjajaran/dr.Hasan Sadikin General Hospital, Bandung, Indonesia)

Abstract

Introduction: The standard procedure of Allergic Rhinitis (AR) Management in Indonesia is based on WHO-ARIA 2008 guideline the study aimed to evaluate the effectiveness of subcutaneous immunotherapy (SCIT) for AR patients in Kasih Ibu General Hospital Denpasar.

Objective: Evaluate the effectiveness of subcutaneous immunotherapy (SCIT) for AR patients in Kasih Ibu General Hospital Denpasar.

Methods: The study was conducted from 2018 to 2019, 21 subjects, quantitative descriptive design, Wilcoxon Signed-Rank test and the McNemar test, significant if the p-value < 0.005 and not significant if the p-value > 0.005.

Results: There was significant improvement (p<0.005) in ARIA classification, nasal symptoms, nasoendoscopy finding and quality of life (QoL).

Conclusion: Allergic rhinitis patient management by subcutaneous immunotherapy is effective.

Article Info

Keywords:

allergic rhinitis, effectiveness, immunotherapy.

*Corresponding author:

Address: Jl. Teuku Umar 120, Denpasar, Bali, 80115, Indonesia
e-mail: tutwuri_handayani71@yahoo.com

1. INTRODUCTION

Allergic rhinitis (AR) is inflammation of the nasal mucosa mediated by Immunoglobulin E (IgE) after exposure to allergens. The inflammatory reaction manifests as rhinorrhea, nasal congestion, sneezing, and itchy nose. Clinical manifestations will repeatedly appear every time a person is exposed to the triggering allergen [1]. Although there is no national prevalence data for AR in Indonesia, a previous study was conducted in 2010 at the Department of Otolaryngology-Head and Neck Surgery, RSUP Dr. Hasan Sadikin Bandung showed the prevalence of AR of 24.5%

[2]. From medical record Hasan Sadikin Hospital Bandung that 66,4% AR patient aged 10-29 years and 45,1% of them are students [3]. Clinical manifestations of AR often lead to decreased quality of life (QoL). Decreased QoL is caused by sleep disturbances and problems with social activities, school, and work performance [1] [3]. This can lead to decreased productivity [4].

Subcutaneous Immunotherapy (SCIT) is a repeated injection of specific allergens for AR therapy. The dosage will gradually increase for patients with type I hypersensitivity symptoms to protect against allergic symptoms and inflammatory reactions due to allergen exposure [5] [6]. SCIT appears to be effective several years after its cessation and improves the QoL of allergic patients [1].

According to the 2008 World Health Organization (WHO) Allergic Rhinitis and its Impact on Asthma (ARIA) Guidelines, AR is classified according to the severity of the disease and the duration of symptoms. The classification consisted of mild intermittent AR (MI-AR), mild persistent AR (MP-AR), moderate or severe intermittent AR (MSI-AR), and moderate or severe persistent AR (MSP-AR). This classification determines the AR treatment plan, including allergen avoidance, patient education, pharmacotherapy, and specific immunotherapy. Pharmacotherapy also differs for each classification, including intranasal corticosteroids, H1 antihistamines, and leukotriene receptor antagonists (LTRA). For persistent AR, intranasal corticosteroids are recommended as first-line therapy. Specific immunotherapy is only recommended for MP-AR, MSI-AR, and MSP-AR [1]. However, the management of AR patients can be adjusted if the patient improves or worsens in the ARIA classification.

ARIA management in Indonesia has been carried out following WHO-ARIA recommendations 2008. However, 2008 WHO-ARIA guidelines are intended to formulate AR management guidelines or management according to the local environment and circumstances [1] [7]. Until now there is no data on the effectiveness of AR management based on 2008 WHO-ARIA Guidelines in Denpasar. Therefore, it is necessary to evaluate the effectiveness of the 2008 WHO-ARIA guidelines in the local scope of Denpasar. Evaluation of the effectiveness of the 2008 WHO-ARIA guideline recommendations will be carried out based on the guideline's therapeutic goals, including improvement of ARIA classification, nasal symptoms, endoscopic findings, and QoL of patients with SCIT. Therefore, this study aimed to evaluate the effectiveness of SCIT management or management in AR patients according to 2008 WHO-ARIA guidelines at the ENT Department of Kasih Ibu General Hospital Denpasar.

2. MATERIALS AND METHODS

This study was conducted at the ENT Department of Kasih Ibu General Hospital Denpasar and used a quantitative descriptive study design. This study was conducted from 2018 to 2019. The study samples were AR patients treated at the ENT Department who met the following inclusion criteria: patients with MP-AR, MSI-AR, and MSP-AR classifications; patients initiating SCIT between 2018 to 2019. And patients who had undergone SCIT for 12 months with allergens from Alk-Abello. The exclusion criteria: patients who started SCIT outside the specified timeframe, patients who underwent SCIT for less than 12 months, patients who did not follow the SCIT schedule regularly, and patients classified as MI-AR.

This study included 21 AR patients who came to the ENT Polyclinic. Subject data was taken from medical records, and permission to disclose information was obtained through the Hospital Ethics Committee. The data were statistically analyzed to determine the frequency of variables and the effectiveness of immunotherapy.

The study variables evaluated included AR classification according to 2008 WHO-ARIA guidelines, nasal symptoms measured by the Visual Analogue Scale (VAS), nasoendoscopy findings according to Lund and Kennedy criteria, and QoL disturbances [8] [9]. The classification of AR

consists of MSP-AR, MSI-AR, MP-AR, and MI-AR. Nasal symptoms are rhinorrhea, nasal congestion, sneezing, and itching. The symptoms were each scored according to the VAS scale. There are three groups based on the VAS score; mild:<2, moderate:2-5, and severe:>5. Assessment based on nasoendoscopy scores, assessed for the presence or absence of nasal secretions and mucosal edema based on Lund and Kennedy criteria. The secret score consists of; a score of 0 if not found nasal secretions; a score of 1 obtained if there are watery and clear secretions; a score of 2 obtained if there are thick and purulent secretions. Edema score consists of; a score of 0 if mucosal edema was not found; a score of 1 if it showed mild mucosal edema; a score of 2 if it showed severe mucosal edema. Impaired QoL was reported as an impaired quality of life and not impaired quality of life. These variables were taken from the patient's first visit record at 0-month, 3rd month, 6th month and 12th month.

The data were then analyzed to evaluate the frequency of each variable at each time point to look at the differences between each time frame and the significance of the changes using the Wilcoxon Signed-Rank test and the McNemar test. The result are considered significant if the p-value < 0.005 and not significant if the p-value > 0.005.

3. RESULT

The general characteristics of the subjects were mostly women (66.7%), with the highest age group being 21-30 years old (38.1%), followed by 11-20 years old (33.3%). The majority of the subjects were students (42.9%) and housewives (33.3%).

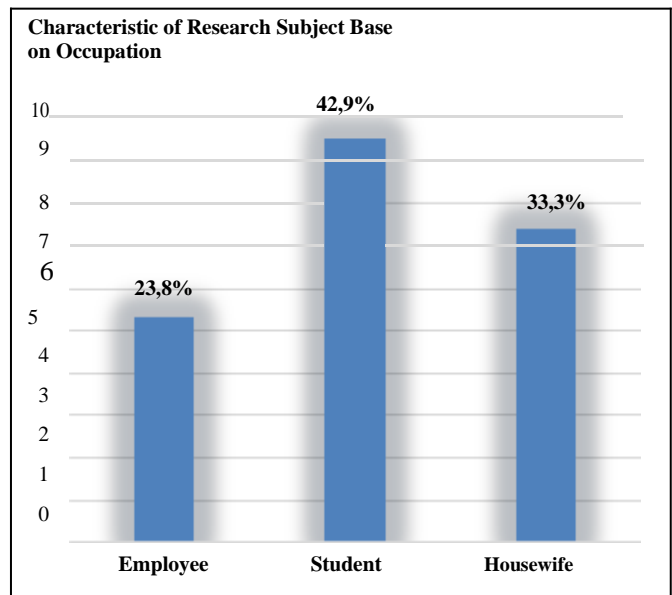


Chart 3. Characteristic of Research Subject Base on Occupation

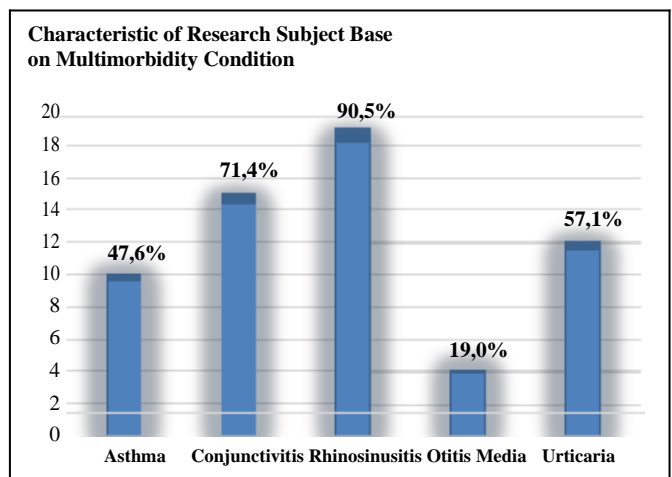


Chart 4. Characteristic of Research Subject Base on Multimorbidity Condition

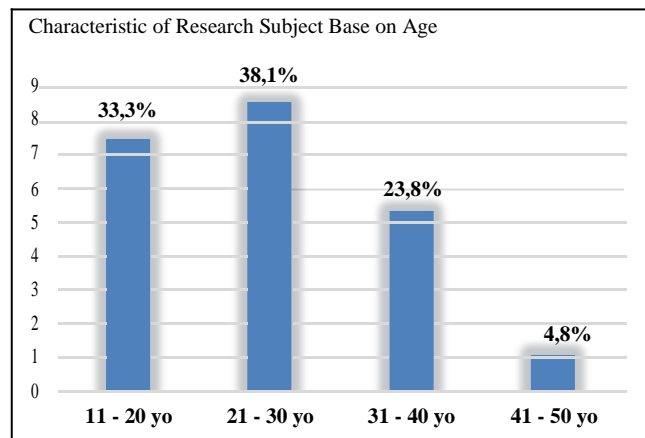


Chart 1. Characteristic of Research Subject Base on Age

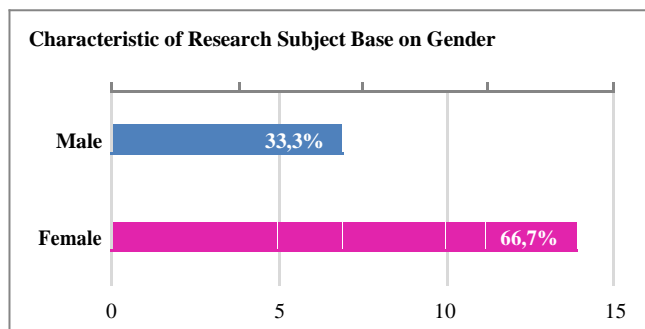


Chart 2. Characteristic of Research Subject Base on Gender

All subjects had the multimorbidity disease. Most subjects were found with rhinosinusitis (90.5%), conjunctivitis (71.4%), urticaria (57.1%), asthma (47.6%) and otitis media (19.0%).

According to 2008 WHO-ARIA guidelines among study subjects at study entry, the classification of AR was MSP-AR with 66.7%, none of the subjects were classified as MI-AR. At 3rd month of therapy, the frequency of patients classified as MSP-AR was reduced to 9.5%, with the highest frequency in the MI-AR classification of 66.7%. At 6th month of therapy, none of the subjects were classified as MSP-AR and MSI-AR. Only 9.5% were classified as MP-AR, while the rest were MI-AR by 90.5%. Evaluation at 12th month found 100% of patients in the MI-AR classification. Statistical analysis results obtained the difference was very significant ($p < 0.005$) for 12 months after SCIT. However, with the Wilcoxon test, a significant improvement was obtained at 3rd month after SCIT ($p < 0.005$), that difference at 6th month and 12th month was not significant ($p > 0.025$).

The most nasal symptoms before SCIT were given were severe rhinorrhea as many as 16 subjects (76.2%), moderate nasal congestion as many as 13 subjects (61.9%), nasal itching as many as 11 subjects (52.4%), and sneezing degrees as many as 14 subjects (66.7%). There was a significant difference after SCIT for 12 months ($p < 0.005$). In the Wilcoxon Signed Ranks test, there were significant results in rhinorrhea symptoms between 0 month to 3rd month ($p < 0.005$), 3rd to 6th month ($p < 0.025$), and 6th to 12th ($p < 0.025$).

Table 1. ARIA Classification, Nasal Symptom, Nasoendoscopy and QOL Impairment Changes at 0, 3rd, 6th and 12th Month

Variable	0 month		3 rd month		AR Patient		6 th month		12 th month		P value (a)*	P value (b)**	P value (c) ***
	n	%	N	%	n	%	n	%					
Aria Classification													
MSP-AR	14	66,7%	2	9,5%	0	0,0%	0	0,0%	P < 0,005	P > 0,025	P > 0,025		
MSI-AR	4	19,0%	1	4,8%	0	0,0%	0	0,0%					
MP-AR	3	14,3%	4	19,0%	2	9,5%	0	0,0%					
MI-AR	0	0,0%	14	66,7%	19	90,5%	21	100,0%					
Nasal Symptom													
• Rhinorea													
Severe	16	76,2%	1	4,8%	0	0,0%	0	0,0%	P < 0,005	P < 0,025	P < 0,025		
Moderate	5	23,8%	11	52,4%	6	28,6%	0	0,0%					
Mild	0	0,0%	9	42,9%	15	71,4%	21	100,0%					
• Nasal Congestion													
Severe	8	38,1%	0	0,0%	0	0,0%	0	0,0%	P < 0,005	P < 0,025	P > 0,025		
Moderate	13	61,9%	10	47,6%	2	9,5%	0	0,0%					
Mild	0	0,0%	11	52,4%	19	90,5%	21	100,0%					
• Itching													
Severe	6	28,6%	1	4,8%	0	0,0%	0	0,0%	P<0,005	P<0,005	P>0,005		
Moderate	11	52,4%	8	38,1%	2	9,5%	0	0,0%					
Mild	4	19,0%	12	57,1%	19	90,5%	21	100,0%					
• Sneezing													
Severe	14	66,7%	0	0,0%	0	0,0%	0	0,0%	P < 0,005	P < 0,005	P > 0,025		
Moderate	7	33,3%	10	47,6%	1	4,8%	0	0,0%					
Mild	0	0,0%	11	52,4%	20	95,2%	21	100,0%					
Nasoendoscopy													
• Secret Score													
2	11	52,4%	1	4,8%	0	0,0%	0	0,0%	P < 0,005	P < 0,025	P > 0,025		
1	10	47,6%	9	42,9%	4	19,0%	0	0,0%					
0	0	0,0%	11	52,4%	17	81,0%	21	100,0%					
• Edema Score													
2	7	33,3%	1	4,8%	0	0,0%	0	0,0%	P < 0,005	P < 0,025	P > 0,025		
1	14	66,7%	9	42,9%	3	14,3%	2	9,5%					
0	0	0,0%	11	52,4%	18	85,7%	19	90,5%					
QOL Impaired													
Impaired	21	100,0%	3	14,3%	1	4,8%	0	0,0%	P < 0,005	P > 0,025	P > 0,025		
Not Impaired	0	0,0%	18	85,7%	20	95,2%	21	100,0%					

Note : AR: Allergic rhinitis; ARIA: Allergic Rhinitis and its Impact on Asthma; MSP: Moderate severe persistent; MSI: Moderate severe intermittent; MP Mild persistent; MI: Mild intermittent; n: Number of AR patient; %: Percentage of AR patient, *P value (a) is the differences in variable between Month 0 and 3, **P value (b) is the differences in variables between Month 3 and 6, ***P value (c) is differences in variables between Month 6 and 12.

Symptoms of nasal congestion had significant results at 12 months after SCIT ($p < 0.005$), and in the Wilcoxon Signed Ranks test, there were significant results at 0 month to 3rd month ($p < 0.005$), 3rd month to 6th month ($p < 0.0025$), but there were a difference result at 6th month to 12th month were not significant ($p > 0.0025$). Symptoms of nasal itching have significant results after 12 months after SCIT ($p < 0.005$), and there are significant results from the Wilcoxon Signed Ranks test at 0 month to 3rd month ($p < 0.005$), 3rd month to 6th month were significant results ($p < 0.0025$), but at the 6th month to 12th month were not significant ($p > 0.0025$). Symptoms of sneezing there were significant results up to 12 months after SCIT ($p < 0.005$), there were significant results at 0 month to 3rd month ($p < 0.005$), significant results at 3rd month to 6th month ($p < 0.005$) but at 6th month to 12th month there were not significant ($p > 0.025$).

Based on the Lund and Kennedy nasal endoscopy criteria results after 12 months of SCIT, the score analyzed with the Friedman test showed a significant result ($p < 0.005$). However, the Wilcoxon Signed Ranks test showed significant results at 0 month to 3rd month ($p < 0.005$) and 3rd month to 6th month ($p < 0.025$), while at 6th month to 12th month, the results were not significant ($p > 0.025$).

In the QoL, 21 subjects (100%) had problems, and it started to decrease at 3rd month after SCIT to 3 subjects (14.3%), and 6th month to 1 person (4.8%), and after 12th month, all patients did not experience QoL interference. In the statistical analysis of QoL between 0 month to 12th using the McNemar test, there was a significant difference ($p < 0.005$).

Statistical analysis in 0 month to 3rd month showed significant results ($p < 0.005$), while at 3rd month to 6th month and 6th month to 12th month, there were in significant results ($p > 0.025$).

4. DISCUSSION

In this study, the incidence of RA was higher in female (66.7%) than male (33.3%). This is similar to the previous study in Bandung, which was 53.3% in 2014 and 69.7% in 2016 [10][11]. This high prevalence in female is due to hormonal differences between the sexes, where estrogen is known to be pro-inflammatory and thus predisposes to atopy [13].

In this study, most were found in the age group 21-30 (38.1%). This was also found in two previous studies in the 18-34 year age group (52.7%) and (42.4%) [10][11].

The distribution of occupation is also similar, with the highest being students (42.9%) and the second-highest being housewives (33.3%). It is known that AR affects school-age children and thus causes learning disorders. Study subjects were mainly between 21-30 years (38.1%), and this trend decreased with age. Previous studies have shown a decrease in atopy with age. A decrease in the concentration of allergen-specific IgE is thought to be the cause of this phenomenon [13].

All subjects had the multimorbidity disease. This is an accordance with what stated in the Task Force Report that AR is an organ specific manifestation of allergic disease. As such, it coexists with other organ specific disorder that have a common allergic basis. It is therefore rarely found in

isolation but frequently has associated multimorbid disorders [14]. This is the same as with the previous study that rhinosinusitis is the common prevalent comorbidity in AR patients [2].

There was a significant change in the distribution of ARIA classification between 0 month to 3rd month. The frequency of MSP-AR, MSI-AR, and MP-AR decreased between the start of therapy to 3rd month, where the frequency of MSP-AR was 66.7%, MSI-AR was 19.0% MP-AR was 14.3% at the start of therapy. Furthermore, it became 9.5% for MSP-AR, 4.8% for MSI-AR, 19.0% for MP-AR, and 66.7% for MI-AR in 3rd month, decreasing by 9.5% for MP-AR, and MI-AR was 90.5%. Lastly, all patients were classified as MI-AR at 12th month. These findings indicate that patients who received therapy according to 2008 WHO-ARIA guidelines experienced improvements in the ARIA classification. A previous study supported the finding that AR patients classified as moderate-severe experienced a significant reduction in disease severity to mild [11] [15].

Symptoms of nasal rhinorrhea, congestion, itching, and sneezing also showed significant improvement from the start of therapy until 6th month, and only rhinorrhea symptom showed a significant result until 12th month. Most patients have moderate and severe symptoms, and most of the patient's symptoms improved to moderate and mild at 6th month [10].

The nasoendoscopy score was assessed for the presence or absence of nasal discharge and mucosal edema based on the Lund and Kennedy criteria. This study showed a significant improvement in the observation time of the nasoendoscopy score ($p < 0.005$) during 12 months immunotherapy. However, significant improvement was only seen at 3rd month and 6th month after immunotherapy, whereas after endoscopic findings, improvement was not significant. This suggests that SCIT can influence the course of AR [16].

The decreased QoL distribution showed a significant change ($p < 0.005$) at 3rd month of therapy, 85.7% of patients did not experience any disturbances. However, at 6th month and 12th month after SCIT, there was no significant decrease ($p > 0.025$). This improvement indicates that SCIT has the long-term ability and can affect the natural course of AR due to an increase in IgA, the effect of IL-10, and inhibition of IgE-dependent mast cell activation. This mechanism causes a decrease in the accumulation of inflammatory cells [5] [6]. This finding aligns with a previous study in which ARIA recommended therapy that significantly improved nasal symptoms, QoL, and disease severity after four weeks. A different study also showed that SCIT was effective in reducing symptoms in AR patients [11] [16].

During this study, there were a few difficulties in collecting data, due to changes in the hospital system. This study is the first study to evaluate the effectiveness of AR management with SCIT and is based on 2008 WHO-ARIA guidelines at Kasih Ibu Hospital Denpasar. There are many studies on the effectiveness of allergen immunotherapy but there are no studies in this city. Therefore, further research is needed.

5. CONCLUSION

SCIT for 12 months was effective in reducing ARIA classification, decreasing nasal symptoms, improving nasal endoscopy findings, and improving QoL in AR patients, with improvement was obtained since 3rd month of immunotherapy and lasted up to 12 months.

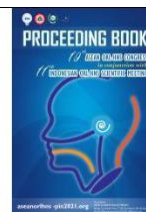
Despite the differences between ARIA practice and recommendations, the management of AR patients based on 2008 WHO-ARIA guidelines proved to be effective and suitable for local situations in Kasih Ibu Hospital Denpasar. Thus, 2008 WHO-ARIA guidelines are suitable for use in other health facilities that mimic the conditions of this study and can thus be used as guidelines for local management of AR patients.

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PROCEEDING BOOK
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A CHILD WITH AN EARRING FOREIGN BODY IN THE ESOPHAGUS DURING COVID 19 PANDEMIC

Steward Keneddy Mengko

Bronchoesophagology Division, Department of Otolaryngology—Head and Neck Surgery Medical Faculty of Sam Ratulangi University/ RSUP Prof. Dr. R.D. Kandou, Manado, Indonesia

Abstract

Introduction: Indonesia is one of the countries that has been widely affected by the spread of COVID-19 infection, resulting in the death of the community, including health workers. Various endoscopic procedures by Otolaryngologist-Head and Neck Surgeon including esophagoscopy in the management of esophageal foreign bodies are aerosol generating procedures (AGP) which are very risky for the transmission of the COVID-19 infection. In this case, reported an earring esophageal foreign body in a 7-month-old baby girl without complaints who were treated during the COVID-19 pandemic at the ORL- HNS Department of RSUP Prof. Dr. R.D. Kandou Manado. An initial preoperative SARS-CoV2 examination was carried out, preparation of Personal Protective Equipment (PPE) and standard equipment modifications according to existing facilities and service policies during the COVID-19 pandemic at the hospital.

Case presentation: A 7-month-old baby girl from a family with poor economic status, came with a history of accidentally swallowing earrings while playing. The patient is calm, conscious and active, able to eat/ drink milk smoothly. No vomiting and respiratory problems. X-ray image shows an earring-shaped radioopaque foreign body in the esophagus at the level of the CVII-TH1 vertebra. The patient was operated on by rigid esophagoscopy under general anaesthesia. An earring was found in the esophagus just below the cricoid, extracted and then hospitalized in the pediatric ward.

Clinical discussion: ingested foreign bodies often occur in children aged 6 months to 3 years. The suspicion of a foreign body was obtained from the parents as witnesses supported by x-photo cervicothoracoabdominal examination. Furthermore, laboratory examinations and initial screening of SARS-CoV2 carried out for this patient, consulted to the pediatric department and preoperative anesthesia. In this case, the foreign body was extracted in a standard operating room and a rigid scope according to the facilities in the hospital. The operation was successful and the patient then treated with pediatrician in the pediatric ward until discharged.

Conclusion: History of ingestion of foreign bodies through history taking from parents as witnesses, clinical symptoms, physical examination and the results of the AP/lateral cervicothoracoabdominal x-ray are very important for diagnostic assessment and management with esophagoscopy according to existing facilities in the hospital with careful preparation related to the COVID-19 pandemic

Article Info

Keywords:

COVID-19 pandemic, esophageal foreign body earring, esophagoscopy

*Corresponding author:

Address: Department of Otolaryngology—Head and Neck Surgery, Medical Faculty of Sam Ratulangi University/ RSUP Prof. Dr. R. D. Kandou Manado, North Sulawesi, Indonesia Jl. Raya Tanawangko Malalayang Manado
e-mail: stewardkeneddymengko@unsrat.ac.id

1. INTRODUCTION

Currently, the attention of the whole world is mostly focused on the global COVID-19 pandemic with its enormous impact.¹⁻⁵ Home isolation in the long term has the potential to increase the risk of household accidents in children such as foreign objects stuck in the Ear, Nose and Throat including the esophagus.⁶

Ingestion of foreign bodies by children is a common problem worldwide. Factors that make it easier to swallow foreign objects in children, among others: immature tooth growth so that food cannot be chewed properly, children's instinctive tendencies due to their curiosity so that they often put various objects in the mouth. This often occurs in children aged 6 months - 3 years.^{7,8} The type of foreign body ingested varies in the community according to eating habits and sociocultural factors. Coins, magnets, batteries, small toys, pieces of plastic, jewelry, buttons, bones, or piece of food are common items ingested in children. Several studies report that metal coins are the most frequently ingested foreign bodies in children.⁷⁻¹⁰

In 80-90% of cases, the foreign body passes spontaneously through the upper gastrointestinal tract but is occasionally retained in the esophagus and need to be removed to avoid complications including: upper GI obstruction or perforation, bleeding, ulceration, fistula. Risk of complications may increase 1% to 35% with iatrogenic maneuvers, very dangerous mediastinitis can occur. 40% of foreign body cases pass asymptotically in children.¹¹ 10% - 20% of cases require endoscopic removal, and 1% or less require surgery. Most cases of esophageal foreign body in children can be treated safely via endoscopy under general anesthesia. The collaboration of ENT specialists, pediatric surgeons,

pediatric gastroenterologists, radiologists and anesthesiologists is often required for optimal patient management.^{11,12}

Several factors determine the choice of treatment for esophageal foreign bodies (EFB), including: age and clinical condition of the patient, size and shape of the ingested foreign body, anatomical location of EFB, doctor skill level, available instruments, surgeon preference.^{13,14}

During the COVID-19 pandemic otolaryngological procedures such as bronchoscopy, laryngoscopy, and esophagoscopy have a high risk of transmitting the Corona virus. The risk is high due to the potential for droplet exposure and aerosolization during the procedure, so various innovations and precautions are needed to prevent transmission to medical personnel.¹⁻⁵

2. CASE REPORT

A 7-month-old baby girl from a family with poor economic status, came with a history of accidentally swallowing earrings while playing. his parents witnessed the incident but could not prevent it from being swallowed. Only one earring is still attached and then it is taken as an example to the hospital. The patient is calm, conscious and active. No fever, cough, dispnea and vomiting. History of feeding: complementary foods for breast milk with vegetables and meat since 6 months years old, but consumes more breast milk. the baby can still eat and drink smoothly. history of defecation and urination: normal.

General conditions dan vital sign was normal. Fully alert. Body weight 6,8 kg. On physical examination there was no abnormality in mouth and throat. On auscultation air entry was bilaterally equal, with no

signs of cyanosis or abnormal sound. The radiograph of neck and chest in anteroposterior view revealed the metal density of earring shaped foreign body as suspected at the level of seventh cervical vertebra (C7) until first thoracic vertebra (T1) (Picture 1.)



Picture 1. A radiopaque FB (earring)

Further laboratory examination and screening with SARS-CoV2 antigen swab showed negative results.

We diagnosed this patient with esophageal foreign body (earring) and planned extraction esophagoscopy under general anesthesia. Patient was consulted to the pediatric department and preoperative anesthesia. In this case, the foreign body was extracted in a standard operating room instead of negative pressure and a rigid scope according to the facilities in the hospital. The limitation in our hospital is that only adult and adolescent size esophagoscopes are available which does not suit the patient's needs, so the scope must be modified using other departmental endoscopes in the operating room that match the size of the esophageal lumen.

The rigid scope was inserted and the earring foreign body was found just below cricoid. The foreign body was held with forceps and then earring removed carefully avoiding damage to surrounding structures. No intra-operative complications were seen. As suspected from radiographs earring stick with mucus were retrieved (Picture 2). All team members in the operating room wear PPE according to protocol.



Picture 2. Esophageal FB (earring)

The operation was successful and the patient was then treated with a pediatrician in the pediatric ward, there was no sign of perforation during the postoperative follow-up until discharged 2 days later.

Picture 2. Esophageal foreign body (earrings) after removal

3. DISCUSSION

Ingested foreign bodies often occur in children aged 6 months to 3 years.^{7,8} The suspicion of a foreign body at this 7 months years old baby girl was obtained from the parents as witnesses, clinical symptoms, physical examination, supported by x-photo cervicothoracoabdominal examination. Furthermore, laboratory examinations and initial screening of SARS-CoV2 carried out for this patient, consulted to the pediatric department and preoperative anesthesia. In this case, the foreign body was extracted in a standard operating room instead of negative pressure and a rigid scope according to the facilities in the hospital.

There are different methods of removing EFBs, for example: the use of Foley catheter, McGill forceps, bougienage, pharmacologic maneuvers, and endoscopy.^{13,14} Rigid and flexible esophagoscopy are the primary modalities for esophageal foreign removal. Rigid esophagoscopy is a safe and effective procedure for foreign body esophagus. It should be done early to reduce mortality and morbidity.^{6,14} Rigid esophagoscopy in children requires a general anesthesia. Flexible endoscopes may be used without an anesthesia, but if a sharp FB is suspected, it might be dangerous

to pull such an object behind the endoscope because of the risk of perforation.^{11,15,16}

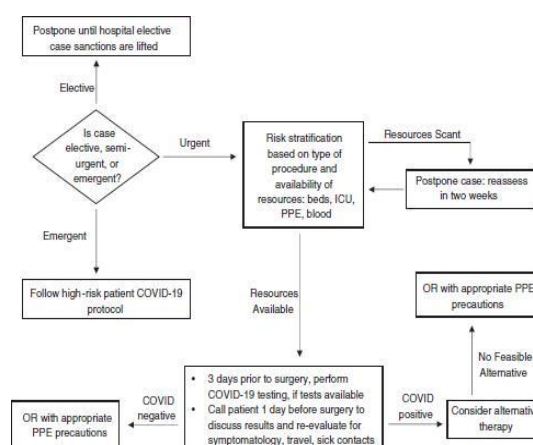
Esophageal foreign bodies are retrieved most commonly by using esophagoscopy, with the rigid esophagoscope used more commonly than the flexible esophagoscope. The advantages of rigid esophagoscopy include: excellent visualization of the esophagus, a variety of types and sizes of extraction instruments and the ability to examine the esophagus directly after removal of the foreign body. In addition, because the procedure is performed under general anesthesia the airway is protected, the child is in no discomfort, and there is a great element of control over both the patient and the procedure. The relative disadvantages are the small risks of a general anesthetic and the greater cost of this procedure compared with any of the other techniques.¹⁴

Before induction of anesthesia, all endoscopy equipment is evaluated by the endoscopist and will need to be ready for immediate use in case of emergency. Ideally, an esophagoscope that fits for infants 3-18 months years old based on the guidelines is a pediatric esophagoscope with a diameter of 5-6 mm.¹⁷ In our hospital, a rigid esophagoscopy is provided as a golden standard for EFBs removal as for this case, despite the limitations in the scope of infant's size, it can still be modified with the appropriate scope from other departments endoscopies set. We performed extraction esophagoscopy under general anesthesia and the EFB was successfully removed using alligator forceps.

In this case, extra strict preparation is required because it is related to the COVID-19 pandemic with the risk of transmitting the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2).

SARS-CoV-2, the virus responsible for COVID-19 has spread widely and become a global pandemic. The virus is transmitted through fomite exposure, respiratory droplets, and aerosolization. Certain ENT procedures, including esophagoscopy, has the potential to trigger droplets, so it is referred to as an aerosol generating procedure (AGP).¹⁻⁴ Many hospitals are adapting to the new challenges related to SARS-CoV-2 infection, so efforts are being made to create new guidelines of COVID-19 to protect health workers and reduce the spread of transmission.^{4,5}

It is necessary to determine the risk stratification prior to endoscopy which is divided into emergent, urgent, and nonurgent. Life-threatening conditions, for example, removal of impacted foreign body in esophagus or bronchus, moderate-to-severe tracheal or bronchial stenosis, symptomatic central airway obstruction, massive hemoptysis, or migrated stent are included in emergency cases. Pathways for emergent and urgent cases operating room (OR) is shown in Picture 3.⁵



Picture 3. pathway for operating room cases⁵

Based on the above scheme, esophagoscopy in this case is a low-risk COVID-19 emergency because the COVID-19 test results within 24-48 hours are negative so that the operating team personnel can only use standard PPE according to the protocol in table 1.⁵

Table 1. PPE recommendations for procedure team members⁵

	Anesthesia provider	Scrubbing/nursing/scrub PPE	Cleaning crew PPE
COVID+ patient for any procedure	<ul style="list-style-type: none"> • Single-use N95 + face shield/goggles • Hood • Gown • Double gloves • Shoe covers 	<ul style="list-style-type: none"> • Single-use N95 + face shield/goggles • Gown • Double gloves • Shoe covers 	<ul style="list-style-type: none"> • Surgical mask • Face shield/goggles • Gown • Gloves
Asymptomatic patient for bronchoscopy, esophagoscopy, laryngoscopy	<ul style="list-style-type: none"> • Single-use N95 + face shield/goggles • Gown • Double gloves 	<ul style="list-style-type: none"> • Single-use N95 + face shield/goggles • Gown • Double gloves 	<ul style="list-style-type: none"> • Surgical mask • Face shield/goggles • Gown • Gloves
Asymptomatic with negative COVID-19 testing for any procedure	• Standard PPE	• Standard PPE	• Standard PPE

4. CONCLUSION

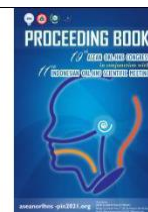
History of ingestion of foreign bodies through history taking from parents as witnesses, clinical symptoms, physical examination and the results of the AP/lateral cervicothoracoabdominal x-ray are very important for diagnostic assessment and management with esophagoscopy according to existing facilities in the hospital with careful preparation related to the COVID-19 pandemic. Preoperative planning with SARS-CoV2 testing, standard PPE and appropriate precautions base on risk stratification of the case and equipment availability is essential for any endoscopic surgery during the COVID-19 pandemic.

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PROCEEDING BOOK
19th ASEAN ORL-HNS CONGRESS
in Conjunction with
11th INDONESIA ORL-HNS SCIENTIFIC MEETING



CORRELATION BETWEEN THE PERFORATION SIZE AND PATENCY OF EUSTACHIAN TUBE AND GRAFT UPTAKE IN INTACT CANAL WALL TYMPANOPLASTY SURGERY - A STUDY OF 32 BENIGN-TYPE CSOM PATIENTS

Artono^{1*}, Nyilo Purnami¹, Edi Handoko², In Seok Moon³

¹ Department of Otorhinolaryngology Head and Neck Surgery, Faculty of Medicine, Universitas Airlangga – Dr. Soetomo General Academic Hospital, Surabaya, Indonesia

² Department of Otorhinolaryngology Head and Neck Surgery, Faculty of Medicine, Universitas Brawijaya – Dr. Saiful Anwar General Hospital, Malang, Indonesia

³ Department of Otorhinolaryngology, Yonsei University, South Korea

Abstract

Background: Factors that contribute to the success of Intact canal wall Tympanoplasty (ICWT) have yet to be certainly known. Several studies show varied success rates and success criteria.

Objective: To learn the correlation between the perforation size and patency of Eustachian Tube and the results of graft uptake on benign-type Chronic suppurative otitis media (CSOM) patients that undergo ICWT surgery.

Methods: This research used observational descriptive analysis. The participants were patients diagnosed with benign-type CSOM who were treated with ICWT surgery in 2018. Data such as demographic data, smoking history, clinical findings including perforation size of tympanic membrane, Eustachian Tube patency, results of pure-tone audiometry examination, results of graft uptake, and type of Tympanoplasty were collected from each participant. The statistic tests in use included contingency coefficient correlation test and Fisher exact test.

Result: Most of the participants were male (53.13%), the average age was 28.03 ± 12.32 years old, and most participants do not smoke (71.87%). The overall graft uptake success rate is 71.87% ($n = 23$), while the failure rate is 28.12% ($n = 9$). Pure Tone Average (PTA) was 37.19 dB at pre-op and 25.79 dB at post-op, which is a significant improvement ($p=0.000$) with average hearing improvement (PTA-Gain) of 15.75 dB. The patent Eustachian Tube functions give the best graft uptake results of 88.90%, followed by partial patency at 75% and non-patent at 40% ($p=0.020$). The highest average of PTA in non-patent function of the tube is 20.94 dB. Hearing threshold improvement (PTA-Gain) on patent, partial, and non-patent ETF groups differs significantly ($p=0.046$). Results of graft uptake on small and medium perforation size show the highest rate of (81.80%), followed by large perforation (50%). The highest PTA in total perforation size is (18.90 dB), then medium (15.14 dB), and small (6.22 dB). The perforation size of TM before surgery does not correlate with the success of graft uptake ($p=0.297$). The size of perforation correlates with improvement of hearing threshold ($p=0.011$).

Conclusion: Eustachian Tube's function has correlation with the success of graft uptake and hearing threshold improvement (PTA-Gain), while the perforation size of TM before surgery correlates with hearing threshold improvement (PTA-Gain).

Article Info

Keywords:

benign-type chronic suppurative otitis media, eustachian tube patency, perforation size, intact canal wall tympanoplasty

*Corresponding author:

Address: Department of Otorhinolaryngology Head and Neck Surgery, Faculty of Medicine, Universitas Airlangga – Dr. Soetomo General Academic Hospital, Jalan Mayjen Prof. Dr. Moestopo No. 6-8, Airlangga, Gubeng, Surabaya, East Java 60286, Indonesia e-mail: artono@fk.unair.ac.id
Phone: +6231-5501649
Orcid ID: 0000-0002-7510-8687

1. INTRODUCTION

Chronic suppurative otitis media (CSOM) is a chronic middle ear infection that lasts more than two months characterized by persistent perforation of the tympanic membrane and continuous or intermittent discharge of secretions from the ear. (1) CSOM is known to be one of the most common diseases in developing countries, one of which is Indonesia. (1,2) Data from WHO (World Health Organization) shows that the prevalence of CSOM in developing countries such as Malaysia, Philippines and Thailand is still relatively high, namely 2-4% compared to that of developed countries in Europe such as Australia, England, Denmark and Finland which is around 0.4%. (3,4) Persistent tympanic membrane perforation and continuous discharge from the ear can cause conductive hearing loss up to 60 dB, which is considered a serious disability. If intervention is not carried out, it can cause serious complications. (5) The surgical therapy approach to benign-type CSOM is the Intact canal wall tympanoplasty (ICWT). The removal of middle ear and mastoid disease is performed by maintaining the posterior wall of the external acoustic canal. The goals of ICWT surgery are to eradicate disease in the middle ear and

mastoid and to reconstruct the hearing mechanism with or without tympanic membrane grafts. (6) Factors influencing the success of ICWT surgery are still in debate. Many factors have been investigated to determine what influences the success of graft closure and hearing improvement. Various studies that have been conducted have shown varying success rates and success criteria. Several studies have shown that the success factor of ICWT surgery depends on the size and location of the perforation, the ossicular status, the type of graft and the function of the Eustachian tube. Other influencing factors include operating technique, operator experience, previous surgical history and smoking status. (2,7,8) The purpose of this study is to learn the relationship between the size of the perforation and patency of the Eustachian tube and the results of graft uptake in benign-type CSOM patients undergoing ICWT surgery.

2. MATERIAL AND METHODS

Participants of this study were benign-type CSOM patients who underwent surgery in 2018 at Dr. Soetomo Hospital, Surabaya, Indonesia. This study used an observational descriptive analysis. Inclusion criteria

included patients diagnosed with benign-type CSOM who underwent ICWT surgery. Exclusion criteria were the presence of underlying disease such as diabetes or immunodeficiency, cholesteatoma and revised surgical cases and incomplete data. There were 136 patients diagnosed with benign-type CSOM and 56 of them (41.18%) underwent ICWT surgery. The number of samples that met the inclusion criteria was 32 patients (57.14%). Participants were identified on their demographic data, smoking history, clinical findings including size of eardrum perforation, Eustachian tube patency, pure tone audiometry (PTA) examination, graft growth results and type of tympanoplasty. Perforation size was assessed in small (less than 50%), medium (50% to 75%) and large (more than 75%). Eustachian tube patency is measured by means of ETF-P (Eustachian Tube Function-Perforated) in Impedance tympanometry. Results of the PTA before and after surgery are measured in decibels (dB). Results of postoperative PTA examination and graft uptake were evaluated after 3 months after surgery and analyzed. Data analysis was conducted using contingency coefficient correlation Test and Fisher exact test on SPSS statistical package (version 16.0; SPSS). The level of significance was $p < 0.05$.

3. RESULT

A total of 56 participants (41.18%) underwent ICWT surgery, 32 of which (57.14%) met the inclusion criteria. The majority of participants were male (53.13%). The average age was 28.03 ± 12.32 years, with median age of 25.50 (13.00-68.00) years. The youngest participant was 13.00 years old and the oldest was 68.00 years old. Most of the participants do not smoke (71.87%). The distribution of patients according to graft uptake success rate is provided in Table 1. Out of the 32 participants that underwent ICWT, the overall success rate of graft uptake rate is 71.87% ($n = 23$), failure rate is 28.12% ($n = 9$), and the highest success rate of graft uptake is in ≤ 20 years (81.81%) age group. Smoking has significant correlation with graft uptake success with the rate of 82.60% ($p = 0.031$). Tympanoplasty type does not correlate with the graft uptake success ($p = 0.447$) (Table 1).

Table 1. Success rate of graft uptake

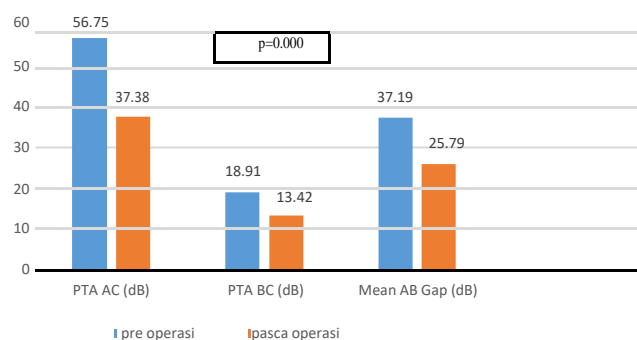
		Quantity	Graft Uptake		Success
			Success	Failure	Rates
Sex					
	Male	15(53.13%)	12	3	80.00%
	Female	17(46.88%)	11	6	64.70%
Age					
	≤ 20	11(34.38%)	9	2	81.81%
	21-30	13(40.60%)	9	4	69.20%
	>30	8(25.00%)	5	3	62.50%
Education					
	Elementary School	0(0,00%)	0	0	0.00%
	Junior High School	3(9.38%)	2	1	66.67%
	Senior High School	20(62.50%)	14	6	70.00%
	Bachelor	9(28.12%)	7	2	77.78%
Smoking					
	Yes	9(28.12%)	4	5	44.44%
	No	23(71.87 %)	19	4	82.60%
(p = 0.031)					
Type of Tympanoplasty					
	Type 1	25(78.13%)	20	5	75.00%
	Type 2	2(6.25%)	2	0	100.00%
	Type 3	3(9.38%)	1	2	33.33%
	Type 4	1(3.12%)	1	0	100.00%
	Type 5	1(3.12%)	0	1	0.00%
p=0.477					

PTA at pre-op amounts to 37.19 ± 18.52 dB (with a range of 23.00-86.25 dB), and 25.79 ± 15.04 dB at post-op, which statistically saw significant improvement of $p = 0.000$ with PTA-Gain of 11.40 dB (Picture 1). The patent Eustachian Tube's function provides the best graft uptake results of 88.90%, followed by partial (75%) and non-patent (40%). Eustachian tube patency significantly correlates with the success of the graft uptake ($p = 0.020$). The largest PTA in non-patent tube function is

(20.94 dB). The results of PTA-Gain in patent, partial and non-patent ETF groups are significantly different with $p = 0.046$. The strength of the relationship is weak ($r = 0.304$). The graft uptake on small and medium perforations shows the same results, namely 81.80%, while for large perforations it shows 50%. PTA is greatest at total perforation size (18.90 dB) followed by medium (15.14 dB) and small (6.22 dB). The preoperative size of TM perforation does not correlate with the success of graft uptake ($p = 0.297$), but it correlates with improved hearing threshold (PTA-Gain) ($p = 0.011$). This relationship is weak ($r = 0.403$) (Table 2).

Table 2. Correlation between Eustachian Tube Patency and Perforation Size and PTA Gain

	Participant No.	Graft Uptake Rate	Graft Uptake Rate (%)	PTA PRE-OP (dB)	PTA POST-OP (dB)	PTA Gain (dB)
Eustachian Tube Patency						
Patent	18	16	88.90%	49.72	41.06	8.66
Partial	4	3	75.00%	68.75	47.25	21.50
Non	10	4	40.00%	60.94	40.00	20.94
Patent			$p = 0.020$			$r = 0.304$ $p = 0.046$
Perforation Size						
Small						
Medium	11	9	81.80%	46.67	40.44	6.22
Total	11	9	81.80%	60.56	45.42	15.14
	10	5	50.00%	56.10	37.20	18.90
			$p = 0.297$			$r = 0.403$ $p = 0.011$



Picture 1. Comparison of PTA Results Before and After Surgery

4. DISCUSSION

This research does not show a tendency for sex differences. Out of 32 participants, the age varies from 13 to 68 years old, with an average of 28.03 years old. The highest result is shown by ≤ 20 years age group (81.81%). Several studies show similar results.(9,10) This indicates the fact that CSOM is primarily a middle ear infection that tends to occur in the first decade of life.(10)

This study shows overall graft uptake success rate of 71.87% ($n = 23$). This is in accordance with the study conducted by Alam which reported graft uptake results of 71.4%.(7) Several other studies show different results. Shiromany reported 83.6% success rate of graft uptake(11) and Naderpour et al. reported similar results at 93.3%.(12) Results of tympanoplasty surgery among smokers and non-smokers continue to be a controversial issue.

In this study, smoking participants have significant correlation with graft uptake success with the rate of 82.60% ($p = 0.031$). This is in line with Cantrell's study.(13) Several studies claimed that there are differences in the results of graft uptake and hearing improvements in smoking and non-smoking patients.(8,12)

Eustachian Tube dysfunction refers to disruption of middle ear ventilation function caused by abnormal opening of the Eustachian Tube. Good middle ear aeration is essential for the success of the tympanoplasty procedure.(7,14) This study shows that patent Eustachian tube function gives the best graft uptake results (88.90%). Eustachian Tube Function (ETF) is significantly related to the success of graft uptake ($p = 0.020$). The rates of improvement of hearing threshold (PTA-Gain) in patent, partial, and non-patent (block) ETF groups differ significantly with $p = 0.046$,

despite the weak relationship ($r=0.304$). These results are in line with that of several other researchers. Alam reported significantly different results of average PTA between patients with patent and non-patent (block) Eustachian tubes ($p=0.022$, $t=2.63$), while no significant difference in graft uptake results ($p=0.629$).⁽⁷⁾ Holmquist, Manning et al. and Merchant et al. also claimed that good Eustachian tube function will increase Tympanoplasty success rate.^(15,16,17) Different results were reported by Li et al. who claimed that Eustachian tube function may not have effects on the results of type I tympanoplasty for CSOM.⁽¹⁴⁾

Results of surgery in this study were measured based on the graft uptake success rate and post-op hearing threshold improvement. Various studies used different criteria to assess hearing improvement after Tympanoplasty, such as hearing gain method or average of Air Bone Gap in each frequency.⁽¹⁸⁾ In this study, the TM perforation sizes that give the best graft uptake results are small and medium sizes (81.80%). However, TM perforation size before surgery does not correlate with graft uptake success ($p=0.297$). This perforation size correlates with hearing threshold improvement (PTA-Gain) ($p=0.011$), which this study shows 15.75 dB in average. Correlation between perforation size and graft uptake success and improvement of hearing threshold is reported by several researchers. Al Ghamdi et al. reported that perforation size is a factor in graft uptake results, although statistically there is no significant differences between small and medium perforation in the graft uptake success.⁽¹⁹⁾ Saleh et al. in their study reported the highest myringoplasty success rate on small perforation at 93.3%, medium and large perforation at 87.5% and 71.4% respectively. A study by Pfammatter et al. claimed success of complete closure of AB Gap on 20% of the patients and AB Gap of 10 dB HL in 80% of the cases. They also reported that perforation size has the most positive impact on the outcome. Thiel et al. reported AB Gap closure up to 10 dB HL on 53% of the patients and claimed that in cases with larger perforations, improvement of hearing is possible.^(20,21,22) Different claim was made by Vartiainen and Nuutinen, in which perforation size affects neither ABG closure and hearing improvement.⁽²³⁾

5. CONCLUSION

Eustachian tube patency correlates with the success rate of graft uptake and hearing threshold improvement (PTA-Gain), while TM perforation size before surgery does not correlate with graft uptake success, but does with hearing threshold improvement (PTA-Gain).

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Ethical clearance was obtained from the Senate Research and Publications Committee of Dr. Soetomo General Hospital

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest in this publication.

FUNDING

None

AUTHORS' CONTRIBUTION

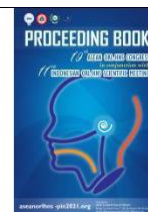
The authors contributed data analysis, drafting and revising the paper, gave final approval of the version to be published and agreed to be accountable for all aspects of the work.

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THE PROFILE OF LARYNGOPHARYNGEAL REFLUX PATIENTS AT DR. SOETOMO TEACHING HOSPITAL, SURABAYA INDONESIA

Rizka Fathoni Perdana^{1*}, Ami Pratami Munifah¹, Sri Herawati Juniati¹, Muhtarum Yusuf¹, Erni Rosita Dewi²

¹Department of Otolaryngology-Head and Neck Surgery, Faculty of Medicine Universitas Airlangga/ Dr. Soetomo Teaching Hospital

²School of Midwifery, Faculty of Medicine Universitas Airlangga

Abstract

Introduction: Laryngopharyngeal reflux (LPR) is a collection of symptoms due to gastric contents or gastroduodenal backflow reflux fluid. The prevalence of LPR is very difficult to determine because of the limitations of the gold standard and the considerable variation in LPR symptoms.

Aim: to determine the profile of laryngopharyngeal reflux patients

Method: This research used analytic retrospectively, the data obtained from the medical record of outpatient unit of the Otolaryngology-Head and Neck Surgery Outpatient Unit, Dr. Soetomo Teaching Hospital. The data obtained in the study are displayed in tables and analyzed descriptively. The research sample was taken according total sampling from January 2017 to December 2018 who met the inclusion criteria.

Result: 42 samples met the requirements. 64.29% patient were female and 35.71% were male with the majority of patient was patient was 41-50 years old (26.19%). Most of the comorbidities had a history of GERD about 76.2%. The mean of the reflux symptom index score performed was 18.38, with a standard deviation of ± 8.01 and the reflux findings scores was 9.11, with a standard deviation of ± 4.25 . The most frequent complaints experience was frequent mucus or clearing of the throat (90.48%) and the most frequent finding in laryngeal endoscopy was erythema/hyperemia (88.1%).

Conclusion: Profiles of patients with laryngopharyngeal reflux were mostly female with age between 41 and 50 years old. The main complaint of the throat felt blocked, and the most comorbidities were GERD

Article Info

Keywords:

laryngopharyngeal reflux, LPR, GERD, extra-esophageal reflux, chronic respiratory disease

*Corresponding author:

Address: Mayjen Prof. Dr. Moestopo No.47, Surabaya, Jawa Timur, 60132

e-mail: rizka-f-p@fk.unair.ac.id

1. INTRODUCTION

Laryngopharyngeal reflux (LPR) is a collection of symptoms due to gastric contents or gastroduodenal backflow reflux fluid. It contains acid, pepsin, and other digestive enzymes to the esophagus, larynx, and hypopharynx, causing contact and injury to the tissue in the upper aerodigestive tract. Laryngopharyngeal reflux has hoarseness, throat clearing, chronic cough, globus sensation, postnasal drip, dysphagia, and sore throat.¹⁻³ Laryngopharyngeal reflux has no specific or pathognomonic symptoms.^{1,2} Laryngopharyngeal reflux may be a symptom continuation of gastroesophageal reflux.^{2,4}

Gastroesophageal reflux disease (GERD) is a condition that can be differentiated and separated from LPR.^{1,3} The most prominent clinical symptoms of GERD are heartburn, regurgitation and difficulty swallowing.² The prevalence of LPR is not known with certainty, but it is estimated that 20-30% of patients with laryngeal complaints are LPR patients. The incidence of the population with symptoms of LPR in the UK studied by Kamani et al. was 34.4%. Research conducted by Koufman was cited by Kamani showing symptoms and signs of LPR in about 4-10% of patients coming to Otolaryngology-Head and Neck Surgery doctors.⁵ The prevalence in America in 2016 was 9.7% of all those who went to otolaryngology doctors. The prevalence of LPR is very difficult to determine because of the limitations of the gold standard and the considerable variation in LPR symptoms.³

The diagnosis of LPR is based on history, clinical symptoms and laryngoscope examination.³ Belafsky, et al., Developed the Reflux Symptom Index (RSI) and Reflux Finding Score (RFS) to simplify the diagnosis of LPR. The RSI questionnaire consisted of nine items to assess various symptoms associated with LPR. Each piece has a scale ranging from zero (no complaints) to five (severe complaints), with a maximum of 45 indicating the most severe symptoms. An RSI score higher than 13 is considered abnormal and shows an LPR.⁶ The RFS score uses an endoscopic examination of the larynx with eight criteria. An RFS score more magnificent than seven means an LPR.⁷ Based on the description above, this study aims to determine the profile of patients with

laryngopharyngeal reflux who are examined at the Otolaryngology-Head and Neck Surgery Outpatient Unit of Dr. Soetomo Teaching Hospital, Surabaya.

2. METHODS

This study is a retrospective study using secondary data from the Otolaryngology-Head and Neck Surgery Outpatient Unit (URJ), Dr. Soetomo Teaching Hospital, Surabaya Indonesia. The research data were taken from the medical records of LPR patients examined from January 2017 to December 2018.

The research sample was of a population that met the inclusion and exclusion criteria. The inclusion criteria in this study were laryngopharyngeal reflux patients over 18 years of age who had undergone RSI and RFS examinations at the Otolaryngology-Head and Neck Surgery Outpatient Unit of Dr. Soetomo Teaching Hospital, Surabaya. The exclusion criteria in this study were age less than 18 years and abnormalities in the larynx.

3. RESULT

LPR patients who checked at the Otolaryngology- Head and Neck Surgery Outpatient Unit, Dr. Soetomo Teaching Hospitals from January 2017 to December 2018 showed 73 patients, 31 patients did not meet the inclusion and exclusion criteria, so only 42 samples met the requirements. A total of 27 LPR patients (64.29%) were female, and 15 (35.71%) were male.

Distribution of Age

The youngest age who experienced LPR was 20 years old, while the oldest age who experienced LPR was ≥ 71 years.

Table 1. Distribution of Age

Age (year)	Number	Percentage (%)
20–30	9	21,43
31–40	7	16,67
41–50	11	26,19
51–60	8	19,05
61–70	4	9,52
≥ 71	3	7,14
Total	42	100

Distribution of Comorbidities

Most of the comorbidities had a history of GERD as many as 32 patients (76.2%), followed by hypertension in 8 patients (19.04%). Two patients (4.76%) had no comorbidities.

Table 2. Distribution of Comorbidities

Comorbidities	Number	Percentage (%)
GERD	32	76,20
Hypertension	8	19,04
No comorbidities	2	4,76
Total	42	100

Major Complaints

The main complaint that was rarely felt was lumpy throat in 15 patients (35.71%).

Table 3. Distribution of Major Complaints

Major Complaints	Number	Percentage (%)
Throat feels lumpy	15	35,71
Hoarse voice	12	38,58
Swallowing pain	6	14,29
Difficulty swallowing	4	9,52
Throat feels dry	3	7,14
Heartburn	2	4,76
Total	42	100

RSI and RSF Score

The mean of the RSI score performed on LPR patients was 18.38, with a standard deviation of ± 8.01 . The mean RFS score in LPR patients was 9.11, with a standard deviation of ± 4.25 .

Table 4. RSI and RSF Score

Assessment	Mean	Standard Deviation (SD)
RSI	18,38	$\pm 8,01$
RFS	9,11	$\pm 4,25$

Reflux Symptom Index

Frequent mucus or clearing of the throat in 38 patients (90.48%) of the total sample of 42 were the most frequent complaints experienced by LPR sufferers.

Table 5. Distribution of Reflux Symptom Index

RSI	Number	Percentage (%)
Hoarseness	28	66,67
Frequent mucus	38	90,48
Excessive mucus / PND (post nasal drip)	35	83,34
Trouble swallowing	23	54,76
Cough after eating / lying down	18	42,86
Difficulty breathing / choking	17	40,48

Annoying cough	22	52,38
A lump in the throat	37	88,09
Heart burn, chest pain, indigestion, acid regurgitation	33	78,57

Distribution of Reflux Findings Scores

Erythema/hyperemia of the larynx in 37 patients (88.1%) from 42 total samples was the most frequent finding in laryngeal endoscopy.

Table 6. Distribution of Reflux Findings Scores

Finding	Number	Percentage (%)
Subglottic Edema	24	57,14
Ventricular obliteration	25	59,52
Erythema/hyperemia of the larynx	37	88,10
Edema the vocal cords	36	85,71
Edema the larynx thoroughly	34	81,00
Posterior commissural hypertrophy	23	54,76
Granuloma / granulation tissue	6	14,29
Thick endolaryngeal mucus	17	40,48

4. DISCUSSION

The ratio between men and women is one to three. A similar study was conducted by Kesari et al. On 200 LPR patients consisting of 123 (61.5%) women and 77 (38.5%) men.⁸ Another study conducted by Andriani, et al., for 51 patients with LPR, there were female (62.75%) and male (37.25%) patients.⁹ The youngest age of LPR patients who sought treatment was 20 years old, and the oldest was more than 71 years. The largest age group with LPR was 41 to 50 years old, with 11 patients (26.19%) (Table 1). The results of this study were the same as those conducted by Ratunanda, et al., with the largest age group 40-49 years as many as 41 patients (47.6%).¹¹

Over 40 years of age, there has been a change in the laryngeal mucosa, namely the superficial layer of edema in the lamina propria, especially in women after menopause. Mucus production is reduced due to changes in the glands in the larynx. Old age histologically, the endoplasmic granular reticulum and Golgi apparatus in the mucus and serosa of the larynx are small so that the quality and quantity of secretions are reduced. Other changes occur in the epithelial mucosa of the vocal cords, which becomes thinner so that at the age of over 40, the larynx is susceptible to acidic substances.

The comorbidities of LPR sufferers in this study were GERD totaling 32 patients (76.2%) (Table 3). This study follows Nennstiel et al., where most comorbidities were GERD in 12 patients (57%).¹³ Reflux gastroesophageal disease is a physiological backflow of gastric content into the esophagus, which can occur 50 times a day, especially after eating. Inflammation of the larynx can be a cause of GERD. Laryngopharyngeal reflux is a supraesophageal manifestation of GERD caused by gastric contents' backflow into the laryngopharynx, thus showing a significant correlation between GERD and LPR. The backflow of acid in LPR is acted by GERD.¹⁴ Patients who have GERD and LPR are related to each other.

LPR sufferers found that the main complaints that caused patients to go to the hospital were 15 patients (35.71%) of the throat felt blocked (35.71%) and the hoarse voice of 12 patients (28.58%) (Table 3). This study follows the one conducted by Lechien et al., The main complaint that many people feel is a lump in the throat and hoarseness of 16 patients (20%). 12 Putri, et al., conducted a similar study. The main complaint was the feeling of a lump in the throat of 43 patients (91.5%).¹⁵ Some of the clinical symptoms of LPR sufferers can include irritation of the throat, changes in voice, and trouble swallowing. Symptoms of throat irritation can include a dry or itchy feeling in the throat, throat clearing or clearing the throat, a sensation of mucus, chronic cough, globus sensation, and sore throat.¹⁶

Reflux causes the mucosal barrier to be damaged, causing trauma,

inflammation, and dysfunction of the respiratory cilia, causing clinical symptoms of a blocked throat, pharyngeal globus, and throat clearing. Reflux also increases nasal secretions and the sensation of secretions in the back of the nose.¹⁵ The mean RSI score in this study was 18.38, with SD \pm 8.01 (Table 5). This study follows the one conducted by Karakaya et al., The mean RSI score was 18.3, with SD \pm 4.4.¹⁷ Another study conducted by Asyari, et al., obtained a mean RSI score of 18.53 with an SD 4.46.¹⁰ Mean RFS score at This study was 9,11 with SD \pm 4,25 (Table 5). Following the research conducted by Nunes et al., the mean RFS score was 9.53, with SD \pm 2.64.¹⁴ This indicated that the patient who came to the Dr. Soetomo hospital was an LPR.

RSI complaints most often experienced by patients with LPR in this study often had mucus or cleared their throat in 38 patients (90.48%) and a lump in the throat of 36 patients (76.19%) (Table 5). This study was similar to that conducted by Lechien, et al., Complaints according to the RSI score were the throat-clearing of 38 patients (92.68%).¹² This study follows the one conducted by Karakaya et al., According to the RSI score, 48 patients (92.7%) and a feeling of blockage in the throat of 37 patients (71.3%).¹⁷ A similar study conducted by Asyari, et al., stated that the most frequent complaints of the clearing were experienced by 30 patients (100%) and 27 patients (90%).¹⁰ The study's results are similar to the study by Ratunanda, et al., Showing that the complaints according to the RSI score were clearing 86 patients (100%) and a lump in the throat of 86 patients (100%).¹¹

There are two theories about the mechanism by which stomach acid can provoke clinical signs and symptoms of LPR disorder. The first theory is due to the direct trauma of pepsin acid to the larynx and surrounding tissue. The second theory is that acid in the distal esophagus stimulates reflex mediated by the vagus nerve resulting in bronchoconstriction, which results in clearing and coughing, resulting in mucosal lesions. Symptoms develop due to direct mucosal trauma or damage to the cilia, resulting in mucus stasis, clearing, and coughing.

Complaints of dysphagia, globus sensation, and odynophagia can cause mucosal inflammation of the upper aerodynamic tract.^{16,19} Hypersecretion of thick mucus causes mucosal irritation because pepsin reduces mucin expression and bicarbonate secretion. These complaints can also be caused by the stimulation of the lower aerodigestive chemoreceptors by refluxate. Symptoms of postnasal drip, throat clearing, globus, and cough are caused by mucus accumulation. Symptoms of dysphonia are a more difficult mechanism and undergo macroscopic and microscopic changes in the mucosa of the vocal cords.

The findings of the RFS score in this study were erythema or laryngeal hyperemia of 37 patients (88.1%) and edema of the vocal cords of 36 patients (85.71%) (Table 6). This study is following that conducted by Andriani et al., The findings of the most RFS scores were 51 patients (100%) of laryngeal erythema, 34 patients (65.38%) of the vocal cords.⁹ This study was similar to that conducted by Asyari, et al., the findings of the most RFS scores were laryngeal erythema in 30 patients (100%) and edema of the vocal cords as many as 26 patients (96.67%).

Belafsky et al. said that RFS is a method that can be used to diagnose and evaluate LPR therapy.⁷ The severity of inflammation and the presence or absence of lesions on the RFS score are associated with LPR. An RFS score is easy to do with a score above seven, having a 94% probability of experiencing LPR. Subglottic edema is associated with non-acid reflux. Posterior commissural hypertrophy and ventricular obliteration were associated with reflux exposure time but not the number of reflux events.¹⁶

5. CONCLUSION

Profiles of patients with laryngopharyngeal reflux were mostly female, the most common age was between 41 and 50, the main complaint of the throat felt blocked, and the most comorbidities were GERD. According to the RSI score, the most common complaint of patients was the frequent clearing of the throat, and endoscopic findings with the RFS score were erythema or laryngeal hyperemia.

Ethical Clearance

Taken from Ethical Committee Faculty of Medicine, Universitas Airlangga.

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Conflict of Interest

None

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Yayasan Perhati Sumatera Utara
Jl. T. Amir Hamzah No. A17, Medan
Phone Number : (061) 42562888
Email : perhatiklsumut@gmail.com

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