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A COMPARATIVE STUDY OF THE SECRETORY IMMUNOGLOBULINS A (S.IGA) IN CHILDREN BEFORE TONSILLECTOMY AND AFTER TONSILLECTOMY VERSUS THE HEALTH CHILDREN

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ABSTRACT

BACKGROUND : Chronic tonsilitis is a very frequently common problem in the population especially in children . Tonsil itself plays role to provide a protective immunological ring at the openings of both digestive and respiratory tracts. The complaints among others are pain while swallowing, fever, until obstructive sleep apnea. It remains controversial whether tonsillectomy decreased immunity, moreover tonsils present immune activity mainly ad the young age. The goal of the study is to analyze the secretory immunoglobulin A level on the chronic tonsillitis children patients before and after tonsillectomy.

METHOD: This study was conducted as a comparative analytic study among the chronic tonsillitis children patients before and after tonsillectomy.

RESULT: The level of secretory Ig A in healthy subjects were 510 ± 802 ng/ml, in chronic tonsillitis patients before tonsillectomy were 1010 ± 3570 ng/ml, and after tonsillectomy were 580 ± 922 ng/ml.

CONCLUSION: The level of s-IgA in chronic tonsillitis prior to tonsillectomy was high and 4 weeks post operation the level of s-IgA decreased, close to the level of normal subjects.

KEYWORDS : Secretory Immunoglobulin A, Chronic Tonsillitis, Tonsillectomy

INTRODUCTION

Tonsillitis is still a problem that is often found in children. Disorders of nutritional adequacy, growth and development, and social life due to complaints caused by this disease in children is a negative impact of tonsillitis (Al-Refay, 2012).

Palatine tonsil is the largest lymphoid organs that produce antibodies through B cells. Tonsils are the first line of defense against various pathogens that enter through the mouth or nose. Tonsils have specific antibodies that will respond to various antigens both humoral and cellular. Immunoglobulins produced by tonsils include Ig G, Ig M, Ig A, Ig E, Ig D. Ig A is the most widely produced immunoglobulin in tonsils. Ig A is produced through plasma cells in the lymphoid mucosa and secreted through the epithelium to the lumen of the respiratory tract and digestive tract. Ig A provides protection through 2 mechanisms: (I) inhibits the attachment of the antigen to the mucosa, (II) inhibits the antigen from penetrating the epithelial surface (Jeyakumar, Miller, dan Mitchell, 2014).

The immune response starts when the antigen enter the tonsillar crypt as the Antigen Presenting Cell (APC) and breaks the antigen into a peptide that will send a signal to form HLA class 2 to attach the T helper cells in the extrafollicular part that produces interleukins and cytokines, then interleukins stimulate cells B to produce immuno globulins to destroy antigens. Tonsilitis is the common disease more in children and often ends with tonsillectomy. Problems that are often faced such as lack of nutrition, and decreased quality of life is a consequence of chronic tonsillitis. Never theless there are still many assumptions that tonsillectomy can reduce immunity (Bitar, Dowli, Mourad, 2015).

Based on the the background and the absence of research on s-Ig A levels in children with chronic tonsillitis before and after tonsillectomy, the authors are interested in conducting this study. The results of this study are expected to supplement data for other studies relating to s-Ig A levels in children with chronic tonsillitis.

METHOD

This study is a comparative analytic study, by examining s-Ig A levels in children with chronic tonsillitis before and after tonsillectomy. The sample was children with chronic tonsilitis who underwent tonsillectomy surgery. This research was carried out at H. Adam Malik General Hospital Medan Medan and several network hospitals (USU General Hospital, Rumkit 1 Bukit Barisan Medan) after obtaining ethical approval. Based on the calculations, a minimum of 23 research subjects were obtained. The research sample was obtained using purposive sampling. Samples will be sent to the University of North Sumatra Faculty integrated laboratory which will be examined using the ELISA method

RESULT

This research was conducted in March to November 2019 with a total sample of 25 people who met the research criteria. Characteristics of the study subjects included sex, indications of tonsillectomy, s-Ig A before tonsillectomy, s-Ig A after tonsillectomy, s-Ig A in healthy individuals, comparison of s-Ig A before and after tonsillectomy. The proportion of patients with chronic tonsillitis who performed tonsillectomy by sex was found to be most numerous in boys than girls. The most indicated tonsillectomy was due to recurrent infection followed by OSA (Obstructive Sleep Apnoe) in second place .

The mean secretory Ig A level before tonsillectomy was 1545.20 with SD = 560.19. The lowest IG A level before tonsillectomy is 1010 and the highest level is 3570 shown in table 1. Average secretory Ig A levels after tonsillectomy are 746.52 with SD = 113.69. The lowest IG A level after tonsillectomy is 580 and the highest level is 922, which is shown in table 2. The mean Ig A secretory level in healthy individuals is 603.24 with SD = 82.18. The lowest IG A level in normal individuals is 510 and the highest level is 820 is shown in table 3. The mean secretory IgA level in healthy individuals is 603.24 (SD = 82.18). Prior to tonsillectomy, secretory IgA levels were 1545.20 (SD = 560.19). After tonsillectomy, secretory IgA levels decrease to 746.52 (SD = 113.69).

Using the Kruskal Wallis test showed that there were significant mean differences in secretory Ig A level between groups of healthy individuals, before and after tonsillectomy ($p < 0.001$). From the results of further tests with the Mann Whitney test also showed significant differences in mean secretory Ig A between groups of healthy individuals and before tonsillectomy ($p < 0.001$), between healthy individuals with levels after tonsillectomy ($p < 0.001$) and between before

and after tonsillectomy (p <0.001) p <0.001) this is shown in table 4.

Table 1. Secretory Immunoglobulin A Levels in Chronic Tonsillitis Patients Before Tonsillectomy

IG A Levels Before Tonsillectomy	n = 25
Average	1545,20
SD	560,19
Median	1400
Minimum-Maximum	1010-3570

Table 2. Secretory Immunoglobulin A Levels in Chronic Tonsillitis Patients After Tonsillectomy

Secretory IgA Levels After Tonsillectomy	n = 25
Average	746,52
SD	113,69
Median	720
Minimum-Maksimum	580-922

Table 3. Secretory Immunoglobulin A Levels in Healthy Individuals

Secretory IgA Levels in Healthy subjects	n = 25
Average	603,24
SD	82,18
Median	580
Minimum-Maksimum	510-802

Table 4. Secretory Immunoglobulin A Levels in Healthy Individuals with Chronic Tonsillitis Before and After Tonsillectomy

Secretory IgA Levels	(SD)	p	Post Hoc	
			Pre Tonsilektomi	Post Tonsilektomi
Health Individuals	603,24 (82,18)	<0,001[a]	<0,001[b]	<0,001[b]
Pre Tonsilektomi	1545,20 (560,19)			<0,001[b]
Post Tonsilektomi	746,52 (113,69)			

DISCUSSION

Tonsil is one of the organs of MALT (mucosa associated lymphoid tissue system) that serves as a defense against bacteria and viruses contained in the oropharynx as the first entrance to bacteria and viruses. Chronic tonsillitis is the most common infection found in all throat diseases, especially in children. This disease occurs due to a subsequent attack on the tonsils that have undergone previous inflammation caused by both viruses and bacteria. Inflammation of the tonsils will cause enlargement which causes difficulty swallowing or as if there is a lump in the throat. In children this condition usually results in complaints of snoring during sleep due to the influence of large tonsils that interfere with breathing.

In this study, chronic tonsillitis sufferers were mostly found in the age group of 10-14 years with male gender more common than women. This is in line with the 2013 Fakh study in the ENT-KL section of RSUP Dr. M. Djamil Padang who reported chronic tonsillitis in children was mostly found in the 10-14 years age group. The same thing was also expressed by cavalcanti et al 2019, which stated the prevalence of patients with chronic tonsillitis was more common in men than women. The provisional hypothesis mentions several possibilities including increased activity in children and unhealthy food intake which results in decreased endurance and triggers recurrent infections but the conclusions obtained to date are still unclear. The most common indication for tonsillectomy was recurrent infection, which was found in 18 patients (72%). Ingram, Fiedman (2015) in his study reported the most common indication of tonsillectomy was a recurrent infection of 56%. This is related to recurrent tonsillar infections resulting in an increase in plasma cells in the subepithelial and intercolytic tissue which will cause tonsillar hypertrophy and cause various complaints such as discomfort, difficulty swallowing, and especially can cause airway obstruction. which is marked by snoring, often sleepy, and decreased learning achievement.

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The levels of Ig A patients with chronic tonsillitis after tonsillectomy are the lowest level of 580, ng / ml and the highest level of 922 ng / ml with an average level of 746.52 ng / ml. Found a decrease in S Ig A levels compared before before tonsillectomy. Sakka, Sedjawidada, Kodrat, Rahardjo (2011) stated a similar thing, namely a decrease in S Ig A levels of patients with chronic tonsillitis after tonsillectomy, from an average of 7539.56 ng / ml ± 2293.07 ng / ml to an average of 5946.43 ng / ml ml ± 2133, 13 ng / ml, The clinical significance obtained is a decrease in s Ig A after tonsillectomy indicates that the number of antigens or the number of infectious germ populations also decreases after the tonsils which are the focus of infection are removed (Santos et al 2013). In this study the lowest level of Ig A healthy individuals was 510 ng / ml, the highest level was 802 ng / ml, with an average level of 603.24 ng / ml.

There is a significant difference in s Ig A levels in patients with chronic tonsillitis before tonsillectomy with s Ig A levels in healthy individuals, p = <0.001 and s Ig A levels in patients after tonsillectomy close to s Ig A levels in healthy individuals p = <0.001. The results obtained in this study are significant differences in S Ig A levels between chronic tonsillitis patients after tonsillectomy with healthy individuals influenced by factors including oral hygine and psychological stress (Engeland et al, 2015). The difference in s Ig A levels in this study compared to other studies is likely due to factors such as differences in salivary retrieval techniques, variations in the time of salivary retrieval, and salivary flow rates (Pignatari, Fortes,Weber,Santos 2013).

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