The Relationship of Diet and Hygiene to the Incidence of Tonsillitis in Children

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Abstract

Background: Everyone has tonsils that can become problematic for some reason. Tonsillitis is an inflammation of the tonsils that occurs due to infection. Inflammation of the tonsils can cause discomfort and difficulty swallowing. These conditions cause disruption to daily activities. The incidence of tonsillitis in Indonesia is still quite high, especially in children aged 5-15 years. Tonsillitis itself is the second highest case in the ear nose and throat (ENT) field. Tonsillitis can occur due to several factors, one of which is closely related to diet and oral hygiene. This article is to determine the relationship between diet and oral hygiene on the incidence of tonsillitis in children.

Methods: The method used was a literature review taken from several sources from 2019-2024. Database for this article such as PubMed, Google Scholar, and Science Direct. The search keywords we used were diet, hygiene, tonsillitis, and child.

Discussion: The highest incidence of tonsillitis in children is due to the body's imperfect immune response. This is supported by children's low knowledge of unhealthy diets such as eating fast food and preservatives. In addition, oral hygiene also contributes to the risk of tonsillitis where children cannot maintain their own hygiene such as washing hands before eating and brushing teeth twice a day.

Conclusion: There is an association between diet and oral hygiene to tonsillitis supported by the immune system that is still in the developmental stage in children.

Keywords: Tonsillitis; diet; hygiene; risk factors

Introduction

Tonsils are collections of lymphoid tissue located in the oropharynx that are composed of Waldeyer's rings.[1] Waldeyer's ring consists of palatine tonsils (faucial tonsils), adenoids (oropharyngeal tonsils), lingual tonsils, and tubal tonsils.[2] When the child is born until less than 7 years of age, the size of the tonsil and adenoid tissue tends to be small. They become larger from 7 to 15 years of age, and shrink again in old age. Tonsillitis is a common ENT poly case where there is inflammation of the palatine tonsils or often referred to as tonsils. Inflammation of these tonsils can lead to tonsil enlargement, resulting in throat discomfort and difficulty swallowing.[3]

Tonsillitis can be found at any age, but is most commonly experienced by children, especially those aged 5-15 years.[4] Cases of tonsillitis are more common in countries with cold climates than in tropical countries. The bacteria that often causes the spread of tonsillitis infection is *Streptococcus pyogenes*.[3] Unfortunately, the World Health Organization (WHO) does not have information on the number of tonsillitis cases worldwide. However, WHO estimates that 287,000 children under the age of 15 undergo tonsillectomy (tonsil surgery), either with or without adenoidectomy. 248,000 of these children (86.4%) had tonsillectomy with adenoidectomy, and another 39,000 children (13.6%) had tonsillectomy alone.[5] According to the Indonesian Ministry of Health, tonsillitis cases account for 23% in Indonesia and the prevalence of chronic tonsillitis according to ENT disease epidemiology data in seven provinces in 2012 was approximately 3.8%. Chronic tonsillitis has the second highest prevalence in Indonesia, after acute nasopharyngitis. [6]

Viral infection, secondary bacterial infection, environmental factors, host factors, allergies, inadequate antibiotic consumption, food and drink are factors in tonsillitis.[6] Eating habits are defined as the way a person or group of people choose and use the food they consume every day. In the current era, foods that contain a lot of oil, flavorings such as Monosodium Glutamate (MSG) and preservatives can trigger itching and sore throat, causing inflammation of the palatine tonsils due to infection in the oral cavity.[5] Unhealthy foods can make tonsillitis worse. Children are very fond of cold drinks, snacks sold outside school and in the home environment that are not clean and contain preservatives. As a result, the immune system decreases as it fights pathogens and the tonsils as the body's defense respond and cause tonsil inflammation. The relationship between tonsil immunological activity and the quality of life of tonsillitis patients can be found at the age of 3 to 10 years.[7]

Based on the explanation above, tonsillitis is the second largest disease in the ENT field and the prevalence of incidence in Indonesia is quite large. Therefore, researchers are interested in knowing the relationship of diet and hygiene to the incidence of tonsillitis in children.

Methods

The method used is a literature review where various literature from several sources are analyzed. References were taken from Google Scholar, Pubmed, and Mendeley from 2019 to 2024. The keywords used in the search were diet; hygiene; tonsillitis; and children. This article also uses secondary data on the incidence of tonsillitis obtained from journals to show the relationship between risk factors and cases.

Discussion

Definition

According to the 2018 Minister of Health Regulation on National Guidelines for Medical Services for the Management of Tonsillitis, tonsils are masses of lymphoid tissue supported by connective tissue with crypts inside and incorporated in Waldeyer's ring. Waldeyer's ring is composed of the Eustachian tube tonsil (*lateral band of* pharyngeal wall or Gerlach's tonsil), pharyngeal tonsil (adenoid), palatine tonsil (faucial tonsil), and lingual tonsil (base of tongue tonsil). The palatine tonsils have epithelium that acts as an immune system for inhaled and ingested antigens. The four zones that are important in the antigen process are: special squamous epithelium, extrafollicular area (T cell-rich area), lymphoid follicular layer, and germinal center of lymphoid follicles (B cells).[8] Meanwhile, according to Muse *et al.*, 2021, anatomically, the tonsils are two glands located at the back of the oropharynx that function as part of the body's defense system that prevents antigens from entering through the oral or nasal cavity. Inflammation of the tonsils caused by bacteria or viruses is called tonsillitis. The disease can be acute or chronic. [9]

Epidemiology

Infectious tonsillitis is much more common in children, but not common in children under two years old. About 53% of children develop tonsillitis in childhood aged 7 years or younger.[10] Chronic tonsillitis has the highest prevalence after acute nasopharyngitis (4.6%), which is about 3.8%, and ranks fifth in terms of morbidity, according to the Household Health Survey.[11] Tonsillitis caused by *Streptococcus* species usually appears in children aged 5-15

years, while viral tonsillitis is more common in younger children. Peritonsillar abscess (PTA) usually occurs in adolescents or young adults, but it can occur at any time.[12]

Classification and Clinical Manifestations

Classification is very important to know the category of a disease. While clinical manifestations are signs or symptoms that arise from a disease. Tonsillitis is divided into three classifications which are detailed as follows: [13]

1. Acute tonsillitis
    1) Viral tonsillitis

       Symptoms include a *common cold with* throat pain. Examination reveals small sores on the palate and tonsils that are very painful.
    2) Bacterial tonsillitis

       The presenting signs are sore throat, pain when swallowing, fever, lethargy, joint pain, no appetite, and otalgia. On examination, the tonsils were found to be swollen, hyperemic, and follicular detritus, and the submandibular glands were swollen.
2. Membranous tonsillitis
    1) Diphtheria tonsillitis

       Symptoms include subfebris, headache, lack of appetite, slow pulse, painful swallowing, and swollen tonsils covered with dirty white patches that can expand to block the airway.
    2) Septic tonsillitis

       This disease is rare as it is caused by *Streptococcus hemoliticus* in cow's milk.
    3) Angina Plaut Vincent

       Symptoms include fever up to 39 degrees Celsius, headache, weakness, hypersalivation, bleeding gums, hyperemic oral and pharyngeal mucosa, grayish-white membranes over the tonsils, and foul-smelling mouth.
3. Chronic tonsillitis

   Examination reveals enlarged tonsils with uneven surfaces, dilated and detritus-filled crypts, a lumpy feeling, dry throat, and odorous breath. The inflammation is recurrent and long-lasting.

Risk Factors

The incidence of tonsillitis can be caused by several factors, one of which is problems with one's diet and hygiene. Socioeconomic factors affect children's health, especially in developing countries; family income, nutrition, hygiene, and accessibility to health services play a major role in children's health status. A study conducted by Putri et al. 2023 by taking medical record data at Dr. Ramelan General Hospital Surabaya in 2019-2021 revealed that most tonsillitis patients were in the age range of 17-25 years and 12-16 years old.[1] These results are not in line with the research of Kawiswara et al., 2024 where the highest incidence of tonsillitis was experienced by children aged 6-11 years (37.1%), followed by children aged 12-16 years (15.7%). The tonsil immune system detects bacterial and viral infections from the age of 3 to 10 years, however, tonsil function tends to decrease with age, especially at the age of 15 years.[14] Children's ignorance causes them not to pay attention to a healthy diet and are more likely to do things that can cause inflammation of the tonsils, such as eating foods available on the roadside, preserved foods, and instant drinks.[15] In addition to diet, oral hygiene also affects the incidence of tonsillitis. Brushing your teeth at least twice a day, using your own eating and drinking utensils, washing your hands after sneezing and coughing can prevent tonsillitis infection. [14]

Table 1. Frequency of Occurrence by Gender[1]

Gender	Frequency
Female	30
Male	38

The findings showed that the prevalence of men suffering from tonsillitis was higher than women. In line with research conducted by Alghamdi *et al.*, 2024 in Saudi Arabia where the incidence of tonsillitis in men was higher at 209 people while women were 184 people.[16] The male immune system is weaker than the female immune system, and men are usually more active so they are more susceptible to pathogens.[17] However, it is not in line with research conducted by Muse *et al., 2021* in Somalia which resulted in a higher frequency of women suffering from tonsillitis, namely 65% of the samples used.[9] Women are more susceptible to throat irritation because they more often consume cold drinks and snacks that contain artificial sweeteners, preservatives, and unnatural colors.[3] In addition, most women often delay or reduce the amount of food they eat to concentrate more on their figure, leading to malnutrition

or consumption of harmful foods, which lowers their immune system and makes them more susceptible to illness or infection.[18]

Table 2: Frequency of occurrence based on classification[1]

Classification	Frequency
Acute	5
Chronic	63

The results revealed that 63 of the 68 samples studied had chronic tonsillitis. In line with research conducted by Jamlean, 2022 where chronic tonsillitis patients were 20 out of 31 samples.[19] This can occur due to the patient's weak immune system or because the patient does not receive adequate treatment, which hinders the healing process and causes recurrent or chronic infections. [1]

Based on research by Jamlean, 2022, the results of the Pearson Chi-Square test showed a value of $p = 0.001$ with a significance level of $\alpha = 0.05$, indicating that there was a relationship between diet and the incidence of tonsillitis.[19] In addition to diet, oral hygiene has also been shown to be associated with the incidence of tonsillitis as revealed by Adetayo *et al.*, 2020 that oral hygiene scores were significantly (p 0.05) correlated with the presence of erythema in the tonsils.[20] Adetayo continued the study in 2021 and revealed that there was a significant proportion of suboptimal oral hygiene status in participants with tonsillitis and/or tonsil hyperplasia. This suggests that there is an association between oral hygiene and tonsillitis and/or tonsil hyperplasia.[21]

Conclusion

From the previous explanation, it can be concluded that there is a relationship between diet and oral hygiene on the incidence of tonsillitis. Children are susceptible to tonsillitis due to immune conditions that are still imperfect or in the developmental stage. In addition, the unbalanced diet of children increases the risk of tonsillitis because a balanced diet can strengthen the body's immune system. Oral hygiene also plays an important role in preventing tonsillitis. Food residue in the mouth can be a breeding ground for bacterial agents, increasing the incidence of tonsillitis. So, education is needed, especially for children to always take care of the food they eat and oral hygiene.

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