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PREVALENCE OF COATED TONGUE IN CHILDREN AGED FROM 6-9 YEARS IN SOUTH OF JORDAN A CROSS SECTIONAL STUDY

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ABSTRACT

Background: Coated tongue is a common condition in children, marked by a discolored or white coating on the dorsal surface of the tongue. Its prevalence varies among populations due to various demographic and environmental factors. Factors include oral hygiene and socioeconomic status, age and gender differences. Poor oral hygiene is recognized as a primary factor contributing to the development of coated tongue in children. Limited access to dental care, often associated with lower socioeconomic status, exacerbates the issue. Gender differences have also been observed, with some studies reporting a higher prevalence among females. **Objective:** This study aims to assess the prevalence of coated tongue among children aged 6–9 years in South Jordan, providing insight into the burden of this condition. **Methodology:** We conducted a cross-sectional study, single center study at Prince Hashem bin Abdullah Military Hospital, Aqaba, South Jordan between the periods first of July 2024 and end of December 2024 on children aged from 6-9 years. Data were collected for demographic information like age and gender. Clinical characteristics such as fissured tongue, geographic tongue, tongue tie, bifid tongue and tooth brushing were analyzed. Statistical analyses were performed using R studio (version 2024.09.0) Vienna, Austria. **Results:** This study included 190 children from the South of Jordan, with a mean age of 5.62 ± 1.67 years. The majority were 5 years old (27.37%), and females comprised 55.26% of the sample. Coated tongue was observed in 5.26% of participants, while fissured tongue, geographic tongue, and tongue tie were found in 2.11%, 0.53%, and 3.16%, respectively. No cases of bifid tongue were recorded. Among children aged 6–9 years, the prevalence of coated tongue was 10.22%, making it the most common oral health condition. Fissured tongue and geographic tongue were present in 4.55% and 1.14% of this age group, respectively. Additionally, 64.21% of participants reported regular tooth brushing. **Conclusion:** This study provides valuable insights into the prevalence of coated tongue among children aged 6-9 years in the South of Jordan, identifying it as the most common tongue related condition in this age group.

KEYWORDS: South Jordan, Children, Oral hygiene, Coated tongue, Pediatric oral health, Retrospective.

INTRODUCTION

Tongue coating refers to a white, yellowish brown, or black tongue coating forms when tongue papillae overgrow and trap bacteria, dead cells and food, sometimes causing discoloration due to bacterial pigments.[1]

It is generally a benign condition. However, coated tongue can be an indicator of poor oral hygiene.[2] The prevalence of this condition varies among populations, influenced by factors such as age, gender, socioeconomic status, and oral hygiene practices.[3] Tongue coating thickness and surface discoloration are different between males and females.[4] Female children are affected by tongue lesions at a higher rate than male children.[5] Children from lower socioeconomic backgrounds face worse oral health outcomes.[6] Some studies have shown that immunocompromised patients, such as those with COVID-19, have a higher prevalence of coated tongue.[7]

Studies have confirmed that investigating the prevalence of tongue lesions is important, as allergies, medical conditions, and medications use are associated with an increased likelihood of developing these lesions.[8] Certain medical conditions, such as xerostomia, along with oral hygiene practices like tooth brushing, have been associated with the presence of coated tongue.[9] Some interesting studies have shown that brushing the teeth with specific agents, such as benzalkonium chloride gel, along with using a tongue brush, effectively reduces

tongue coating and bacterial load on the dorsal tongue surface.[10] Children who participated in physical activity showed improved dental health and a lower prevalence of tongue covering.[11]

This study aims to assess the prevalence of coated tongue among children aged 6–9 years in South Jordan, providing insights into the burden of this condition and identifying potential risk factors. By understanding these associations, targeted interventions can be developed to improve pediatric oral health outcomes in the region.

METHODS AND MATERIALS

Study design

This study was a retrospective observational analysis conducted on pediatric patients to assess the prevalence of coated tongue and other tongue related conditions. The study aimed to evaluate demographic characteristics, oral hygiene practices, and associated oral health conditions among children aged 6-9 years in the South of Jordan. Data were collected from medical records of patients managed at Prince Hashem bin Abdullah Military Hospital, Aqaba, South Jordan between the periods first of July 2024 and end of December 2024

Data collection

A total of 190 children aged 6–9 years were included in the study. Patient demographics, oral health characteristics, and hygiene practices were extracted from medical records. The collected variables included age, gender, the presence of coated tongue, fissured tongue, geographic tongue, tongue tie, and bifid tongue. Data on tooth brushing habits were documented. All extracted data was recorded in a structured database for statistical analysis.

Ethical consideration

This study approval was waived by the Institutional Review Board (IRB) committee in the Royal Medical Services, Amman, Jordan (approval no: ###). This study was conducted in accordance with the declaration of Helsinki 1964. Approval was obtained before data collection. Patient data was anonymized and stored safely throughout the study period.

Statistical analysis

Descriptive statistics were used to summarize the demographic and oral health characteristics of children in the South of Jordan. Continuous variables, such as age, were presented as mean ± standard deviation (SD). Categorical variables, such as gender and oral health conditions, were summarized using frequencies and percentages. The prevalence of coated tongue was calculated as the proportion of children who had a coated tongue, expressed as a percentage. All statistical analyses were performed in R 4.4.2 (Vienna, Austria).

RESULTS

In this study, which included a total of 190 children in South of Jordan, **Table 1**, shows the Demographic of the participants. The age distribution of the patients shows that the mean age was 5.62 years with a standard deviation of 1.67 years, indicating a relatively young population with some variation. The largest proportion of participants were 5 years old (27.37%), followed by those aged 6 (19.47%) and 4 (15.79%). Fewer participants were found at older ages, with only 5.79% being 9 years old and just 0.53% being 10 years old. The data indicates a younger population overall, with ages predominantly between 3 and 8 years.

Regarding gender distribution, there were 105 female participants (55.26%) and 85 male participants (44.74%), suggesting a slightly higher number of females in the sample. As for oral health characteristics, 5.26% of participants had coated tongue, while 2.11% had a fissured tongue. A smaller proportion of the sample had geographic tongue (0.53%) and tongue tie (3.16%). Notably, no participants had a bifid tongue. Additionally, 64.21% of participants practiced tooth brushing regularly.

The prevalence of coated tongue among children aged 6-9 years in the South of Jordan (**Figure 1**) was calculated based on a sample of 88 patients, of whom 9 were found to have coated tongue. The prevalence was determined to be 10.22%.

The study on the prevalence of oral health conditions in children aged 6-9 years in the South of Jordan (**Table 2**) revealed the following findings: 10.23% of the children had a coated tongue, making it the most common oral health condition in this age group. 4.55% of the children had fissured tongue, while 1.14% exhibited geographic tongue and tongue tie, each representing a smaller proportion of the population. Notably, 0% of the children had bifid tongue, indicating its absence in this sample.

DISCUSSION

Our study included a total of 190 children in South of Jordan. Our sample has slightly higher number of females. Tongue abnormalities were observed among these children, with 5.26% presenting with a coated tongue and 2.11% with a fissured tongue. Additionally, geographic tongue and tongue tie were noted in 0.53% and 3.16% of the sample, respectively. Notably, no cases of bifid tongue were identified. The prevalence of oral health conditions in children aged 6-9 years in the South of Jordan showed that 10.23% of the children had a coated tongue, making it the most common oral health condition in this age group. A study conducted among Iranian schoolchildren, reported a prevalence of tongue lesions at 29.9%.[5] Another study aimed to determine the prevalence of tongue lesions and reported a prevalence of coated tongue at 8.2%.[12] A study on tongue lesions in the Pakistani population, found that coated tongue was the most prevalent tongue lesion in this population.[13] Our study revealed that 4.55% of the children had fissured tongue. Another study conducted in Jordan, reported fissured tongue as the most common tongue

lesion, diagnosed in 11.5% of participants.[13] In Iraqi population, fissured tongue has been reported as the most common tongue lesion, followed by geographic tongue, coated tongue, and hairy tongue.[14] Geographic tongue in children is linked to a distinct oral microbiota composition, with more Prevotella oris and less Streptobacillus and overrepresented bacteria.[15] For symptomatic pediatric cases of geographic tongue, tacrolimus and good oral hygiene are recommended, while no treatment is necessary for asymptomatic cases.[16] In our study, geographic tongue and tongue tie were each observed in 1.14% of the participants, representing a smaller proportion of the sample.

Bifid tongue is a rare condition that can be either syndromic or non-syndromic and typically occurs alongside other oral abnormalities.[17] In our study, none of the children presented with a bifid tongue, confirming its absence in this sample.

Tongue hygiene, along with a healthy diet and lifestyle, contribute to better overall health in pediatric patient.[18] Various factors impact children's oral health and the development of good hygiene habits, with mother's knowledge, attitudes, and practices playing a critical role.[19] Some studies have examined the relationship between knowledge level and tongue brushing habits in coated tongue patients, showing that good knowledge of tongue hygiene doesn't always translate into proper brushing habits.[20]

Strengths of this study include the inclusion of demographic and oral health variables which allow for a comprehensive understanding of potential contributing factors. However, specific limitations should be acknowledged. The retrospective design may introduce information bias. The single center nature of the study limits generalizability.

We encourage future research to focus on prospective multi-center studies to enhance generalization. Additionally, public health initiatives promoting tongue hygiene education, particularly among parents and caregivers, may help reduce the prevalence of coated tongue in children. Integrating oral health awareness programs into school curricula could further reinforce preventive practices from an early age.

Table 1: Demographic and Oral health characteristics of children in the south of Jordan.

Characteristic	N = 190[1]
Age	5.62 (1.67)
Gender	
Female	105 (55.26%)
Male	85 (44.74%)
Coated Tongue	10 (5.26%)
Fissured Tongue	4 (2.11%)
Geographic Tongue	1 (0.53%)
Tongue Tie	6 (3.16%)
Bifid Tongue	
NO	190 (100.00%)
Tooth Brushing	122 (64.21%)
[1] Mean (SD); n (%)	

Table 2: Prevalence of oral health conditions in children aged 6-9 in the south of jordan.

Oral health conditions	Coated tongue	Fissured tongue	Geographic tongue	Tongue tie	Bifid tongue
Prevalence	10.22	4.54	1.13	1.13	0

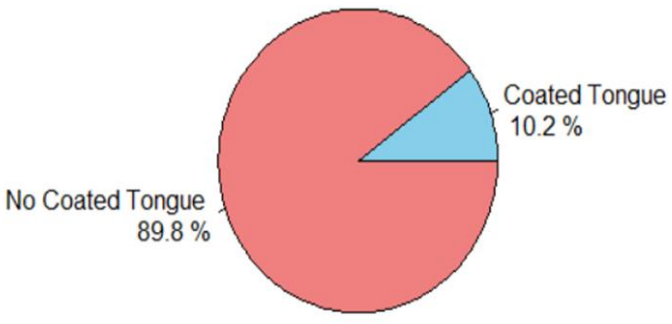

Figure 1: Prevalence of coated tongue in ages 6-9.

CONCLUSION

This study provides valuable insights into the prevalence of coated tongue among children aged 6-9 years in the South of Jordan, identifying it as the most common tongue related condition in this age group. The findings highlight the influence of oral hygiene practices, and demographic factors. While the study's single center design limits the generalizability of the results, it underscores the need for improved awareness and preventive measures.

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