

## Prevalence of Mandibular and Palatal Tori among 5-15 Years Old Children in Khartoum State, Sudan

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### Original Research Article

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**Abstract:** Torus is a ridge of bone or muscle that are usually asymptomatic unless ulcerated but may sometimes affect speech and tongue movement, Torus palatinus and torus mandibularis are the most common tori in the oral cavity. The objective of this study was to determine the prevalence of torus palatinus and torus mandibularis among 5-15-year-old schoolchildren. A descriptive cross sectional school based study among 894 children selected by systematic random sampling from 10 basic schools in Khartoum locality. Children were examined by mouth mirror at schools in an upright chair, where presence, size, site of tori in the mandible and maxilla were recorded in check list. Comparison between variables using chi square test with the level of significance set at value  $<0.05$ . The prevalence of tori was 25% with the highest occurrence being the palatal 23.7% and mandibular 5.7%, females count was more predominant compared to males 63%, 37% respectively. There was a significance correlation between the age of the children and presence of tori, Also between the presence of mandibular and palatal tori and occurrence of bilateral tori  $p<0.05$ . The prevalence of tori was high among basic schoolchildren in Khartoum locality, females were more affected with age 12-15 being the most and the most common site was palatal

**Keywords:** mandibular tori, palatal tori, exostoses.

### INTRODUCTION

Tori is the plural of the word torus which is defined as "A ridge of bone or muscle" [1]. An exostosis is an outgrowth of bone from the cortical bone, the two most common intraoral tori in the oral cavity are the torus palatinus and torus mandibularis.

A torus is usually asymptomatic and discovered accidentally during examination of the oral cavity unless the overlying mucosa is ulcerated, the cause of tori is unknown but said to be multifactorial with genetic, environmental, age, sex, regional factor and ethnic factor playing a role. Torus palatines usually arise along the midline suture of the hard palate while torus mandibularis arises along the lingual aspect of the mandible above the mylohyoid line they are usually bilateral [2]. Torus mandibularis could be a cause of inability to visualize the larynx, which can interfere with translaryngeal placement of laryngeal tube as showed by a case report by woods *et al.*, [3].

Tori are classified by Woo [4] according to the size into Small less than 5mm, Medium: given to thick and well defined bone nodules forming continuous ridges and is at least 2cm in length, large more than 2 cm in length and width. According to the shape into, flat slightly convex with slight protuberance, Lobular pedunculated or sessile, Nodular multiple protuberance occurring with individual base, Spindle present along the palatal raphe and elongated bilaterally in the mandible. Their relationship with parafunctional habits may stipulate the increased risk for temporomandibular

joint disorders, which may be due to pressure over the cortical bone around the premolars [5]

Phenytoin a drug mainly used to treat epilepsy-causing thickening of the skull and increase in coarse features of the face, it also has anabolic action on bone cells. A case report showed large mandibular and palatal tori in a 45-year-old Japanese, there was increase in the growth of the tori with the increase in phenytoin dose from 1985 -1997 and the patient had no familial background [6]. Selvein conducted a study and found that 85% of children with torus Mandibular is or torus palatinus had at least one parent with one or the other anomaly [7]. A study by Eggen *et al.*, suggested that there is a correlation between existing teeth and presence of torus mandibularis [8].

When replacing absent teeth in an edentulous patient using conventional or implant supported dentures special considerations made to the form of the alveolar bone. Many techniques can be used to change the shape of the tori and use it to augment the alveolar bone. This is important for aesthetics and providing sufficient bone for the implant when indicated [9].

Generally, tori are asymptomatic and don't require treatment but in some rare cases they may enlarge to a massive size which may affect speech and feeding or when in some cases for prosthetics reasons their surgical excision may be indicated [10].

## MATERIALS AND METHODS

This was a Descriptive cross-sectional school based study among schoolchildren age 5-15 years old in Khartoum locality one of the seven localities of Khartoum state – Sudan conducted from the period of December 2016- February 2017

Ten schools were selected randomly using cluster sampling technique out of 184 schools. 900 students were selected from a total number of the 51,402 students using  $SS = z^2 (p)(1-p)/c^2$ , and then by systematic random sampling a sample size for each school was selected. Boys and girls within the selected schools and age groups were included while mentally and physically diseased; students aged more than or less than 5-15 years old, Non Sudanese students, Students with history or present cleft palate excluded.

Data was collected using Sterile examination sets (mirrors, probes,), data sheets and a checklist which included presence or absence of tori, mandibular or maxillary. The selected students set in an upright chair, the floor of the mandible and the palate examined for the presence of tori. Data then organized, cleaned and

inserted on master sheet in personal computer. Statistical package of social sciences (SPSS) version 21.

Data was displayed in form of tables and figures and comparison between variables done by chi square test with level of confidence set at p value  $\leq 0.05$

The Requirement of participants was voluntary, Subject could withdraw at any time and there was Absolute privacy and Confidentiality. Ethical committee from UMST and ethical committee & Ministry of education approved study. Students and their parents requested to participate voluntary with an informed written consent.

## RESULTS

This study included 894 students from grade 1-8. The students were examined for the presence of tori in which there were 330 males and 564 were females. The prevalence of tori was (25%) in the total study population. The results for the prevalence divided into 2 categories to illustrate which tori had the highest occurrence and found that the 5.7% were mandible (Table-1) and 23.7% occurred in palate (Table-2). Chi square test was completed to disclose whether there is a relation between tori and specific factors and was observed that there was a significant correlation between age and tori in (Table-3) p value = 0.00 and there was no correlation between gender and tori (Table-4) p value = 0.09.

**Table-1: Prevalence of mandibular tori among 5-15 years old school children**

Mandibular		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	843	94.3	94.3	94.3
	Yes	51	5.7	5.7	100.0
	Total	894	100.0	100.0	

**Table-2: Prevalence of palatal tori among 5-15 years old school children**

Palatal		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NO	682	76.3	76.3	76.3
	Yes	212	23.7	23.7	100.0
	Total	894	100.0	100.0	

**Table-3: Relationship between age and the presence of tori among 5-15 year old children**

		Count	Tori		Total
			NO	Yes	
Age	(5 thru 7)	Count	109(88.6%)	14(11.4%)	123(100.0%)
	(8 thru 11)	Count	393(79.2%)	103(20.8%)	496(100.0%)
	(12 thru Highest)	Count	168(61.1%)	107(38.9%)	275(100.0%)
Total		Count	670(74.9%)	224(25.1%)	894(100.0%)

P value = 0.000

Table-4: shows the relationship between children gender and the presence of mandibular or palatine tori

		Presence of Tori		Total
		NO	Yes	
Gender	Female	414(73.4%)	150(26.6%)	564(100.0%)
	Male	256(77.6%)	74(22.4%)	330(100.0%)
Total		670(74.9%)	224(25.1%)	894(100.0%)

P value=0.095

## DISCUSSION

Tori are common findings in the oral cavity, several studies have been conducted to study the prevalence of tori, and however there are very few published data about this problem in Sudan.

This is the first descriptive cross sectional school based study in Khartoum locality, from 10 different schools.

Age played a role in the prevalence of tori in this study, the sample consisted of ages 5-15 years old and the majority of the students were of this age (figure-1).

Our larger sample size, smaller age group and randomization explained the prevalence of tori in our study when compared to study by Helen [12] in Khartoum College.

In contradiction to the study done by Nwoga [13] in east Nigeria our study showed a higher prevalence of palatal tori compared to mandibular, however the study by Erkan [14] in Turkish school children and the study by Bayat [15] in the university of the west Indies supported our finding.

In this study, there was a higher prevalence of tori among females, which is similar to the finding in the study by Erkan [14] in Turkish schoolchildren, which may be due to difference in sample size. A research about the prevalence of torus palatinus and torus mandibularis in an Indian population by Patil *et al.*, [16] found that the prevalence of tori was lower. There was a superior population size compared to those in this research and results showed a higher prevalence in mandibular tori than palatal therefore opposing the results. The research carried out in Sulaimani city [17] had similar results to that conducted in India but with a lower percentage in prevalence. However, the study in Malaysia had comparable results to this research and showed a higher prevalence in torus palatinus than mandibularis this may indicate that the prevalence differs due to genetics and environmental factors [2, 8, 9].

The prevalence of tori was 25% among basic schoolchildren in Khartoum locality, the prevalence was highest among females with 12-15 being the most affected age, palatal tori being the most common site. Further studying to include larger sample with involvement of the participants from the whole

Khartoum state is needed. Correlation of tori with other clinical factors might make a fascinating topic for further studies

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