Orthopantomography Imaging Characteristics Prevalence Of Asymptomatic Tonsilloliths In Bhubaneswar City Hospital: A Retrospective Study.

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Abstract

Objective: This review is expected to gauge the pervasiveness of palatine tonsilloliths and break down all-encompassing imaging highlights.

Study Design: The OPG images of 500 patients (195 men, 305 women; mean age, 35.8 years) were reviewed. The appropriation, aspect, morphology, and area of each tonsillolith were evaluated. The correlation between participant demographic characteristics and the characteristics (prevalence, number, size) of tonsilloliths was determined.

Results: The prevalence of tonsilloliths was 19.04%; we identified significant differences in the prevalence, unilateral or bilateral involvement, and size between men and women. The prevalence of tonsilloliths significantly increased with age ($P < 0.05$). Ovoid-molded tonsilloliths were the most widely recognized (around 80%). The focuses of the tonsillar graves contained most of the tonsilloliths.

Conclusion: The outcomes, in light of a bigger example size contrasted and past investigations, can be applied as rules for the finding of tonsilloliths on OPG images.

INTRODUCTION:

A tonsillolith is a calcified structure that happens because of constant and repetitive irritation in extended tonsillar crypts. (1) Various conclusions have been distributed about the etiopathology of tonsilloliths. A few creators have recommended that collected epithelial tissue, serum, parasite, microbes (basically gram-positive), food trash, etc may gather in the tonsillar tombs and start solidification development. Furthermore, it has been proposed that tonsilloliths have characteristics in common with biofilms and that chronic inflammation accelerates the development of tonsilloliths. (2,3) Tonsilloliths, otherwise called tonsil stones or tonsillar calculi are remarkable calcified structures that create in broadened tonsillar tombs, because of an uncommon type of dystrophic calcification. (2,4) These stones are made out of calcium salts, for example, hydroxyapatite or calcium carbonate apatite, oxalates, and other magnesium salts and ammonium revolutionaries. (5) Small tonsilloliths are usually asymptomatic. In any case, huge tonsilloliths may cause side effects, for example, unfamiliar body sensations in the oropharynx, expansion of the tonsil, pharyngalgia, otalgia, odynophagia, dysphagia, and halitosis. (3) Late examinations have recognized the connection between tonsilloliths and different conditions like halitosis and tonsillar abscess. Tonsilloliths can be hard to recognize from the calcification of different constructions (lymph nodes, veins, or salivary glands), intraosseous anomalies, dislodged teeth, and unfamiliar bodies. These can likewise be mistaken for other anatomic constructions, for example, a prominent Hamulus of the pterygoid, an extended styloid process, or an enormous maxillary tuberosity. Although tonsilloliths are not rare, sometimes it is accidentally seen through OPG or on CBCT (coronal view)(6). On panoramic radiographs, small radiopaque tonsilloliths with indefinite margins can be seen to overlap with the central part of the mandibular ramus. In this study, we aimed to determine the prevalence of tonsilloliths based on OPG findings, those data previously available in the hospital record from 2020 to 2021.

Figure 1 : Orthopantomogram reveals multiple radiopaque areas in the mandibular ramus both on right and left side

Figure 2: Cropped Orthopantomogram reveales multiple radiopaque areas seen mandibular ramus in the region (right side & left side)

MATERIALS AND METHODS:

In this retrospective study, 500 panoramic views (305 female, 195 male, age 6 to 80 years old) of patients referring to our department, between 2021 to 2020, were retrieved and re-evaluated for the presence of tonsilloliths. Panoramic radiographs were acquired using a digital panoramic MYRAY, model- HyperionX9, serial no – SN70870206 (Finland; 76 kVp, 5mA). All-encompassing perspectives on satisfactory quality were enlisted in the review. The presence of tonsillar calculi was assessed on all-encompassing radiographs by two aligned oral radiologists and a post-graduate understudy, utilizing the rules revealed by Ram et al. that referenced tonsilloliths as radiopaque nodular mass, or masses stacked up on the mandibular ramus and soft palate. (7) One-sided or reciprocal event, pervasiveness as indicated by age and sexual orientation were recorded. The cases with tonsilloliths were isolated into subgroups as indicated by both size (less or multiple mm) and number (less or more than 5). Since the radiographs had been taken for other dental purposes, no additional portion was presented to the patients and no name or individual data of patients was recorded in reports and figures, thus, there was no moral restriction to lead the review. (8) For data collection, we used the software: IBM SPSS Statistics for Windows, version 25.0, Armonk, NY: IBM Corp. Data was presented in the form of mean and standard Deviation. Categorically variables were compared between two groups using the Nonparametric Test of significance including the Mann Whitney U test when 2 variables were present and the Kruskal Wallis test when multiple categories were involved. The P-value was kept at 0.05. The P-value below 0.05 was considered statistically significant.

RESULTS:

Out of 500 individuals, 97 (19.04%) were judged to have tonsilloliths on panoramic radiographs.

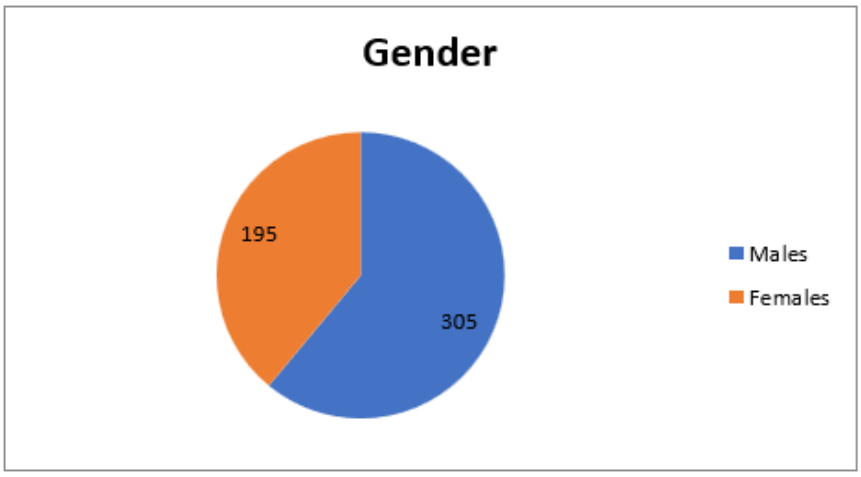

Figure 1: Pie chart distribution of gender distribution of the population

1. Prevalence based on the gender

		Males		Females		Z Score/ P-Value
		Frequency	Percent	Frequency	Percent	
Tonsillolith	**Absent**	153	78.5	250	82.0	0.966/0.334
	Present	42	21.5	55	18.0	
	Total	195	100.0	305	100.0	
Tonsillolith type	**Absent**	153	78.5	250	82.0	1.121/0.262
	Unilateral	25	12.8	41	13.4	
	Bilateral	17	8.7	14	4.6	
	Total	195	100.0	305	100.0	
Tonsillolith frequency	**Absent**	153	78.5	250	82.0	1.043/0.297
	Single	25	12.8	37	12.1	
	Multiple	17	8.7	18	5.9	
	Total	195	100.0	305	100.0	

Table 1: Prevalence of tonsilloliths according to gender

Table 1 shows the prevalence of tonsilloliths, their types, and frequency according to gender. In the study population, 21.5% of males and 18% of females showed the presence of tonsillolith. Among them, 12.8% of males had unilateral tonsilloliths and 8.7% of males had bilateral tonsilloliths. Similarly, 13.4% of females showed unilateral tonsilloliths and 4.6% of females showed bilateral tonsilloliths. For the frequency of tonsilloliths, among males, 12.8% had a single frequency, 8.7% had multiple frequencies. Among the females, it was seen that a single frequency of tonsilloliths was seen among 12.1% and 5.9% of them had multiple frequencies. The same has been graphically represented in Figure 1.

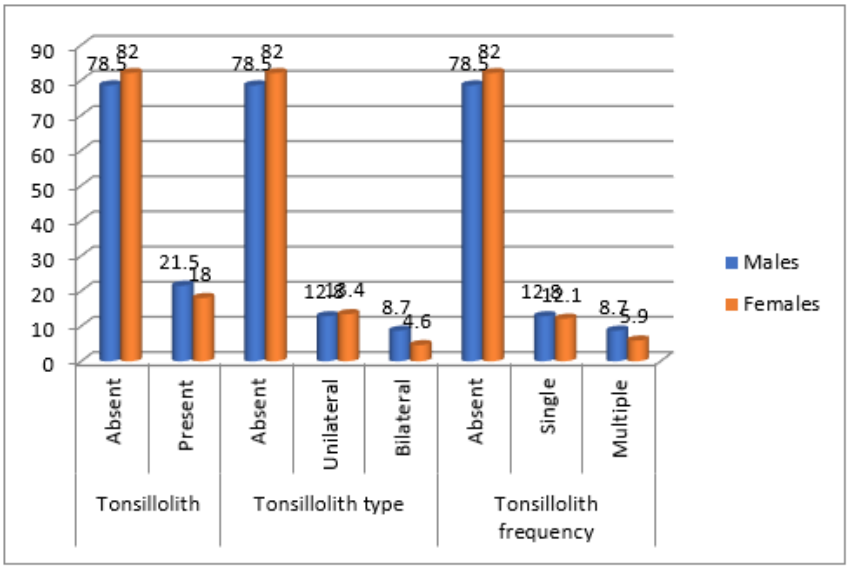

Figure 2: Graphical representation of the prevalence of tonsillolith

2. Prevalence based on age

Age		Frequency	Percent	Kruskal Wallis/ P-Value
17years to 30 years	**Absent**	137	74.5	33.22/<0.0001*
	Present	47	25.5	
	Total	184	100.0	
31 years to 45 years	**Absent**	129	74.1	
	Present	45	25.9	
	Total	174	100.0	
46 years to 60 years	**Absent**	61	92.4	
	Present	5	7.6	
	Total	66	100.0	
61 years to 75years	**Absent**	44	100.0	
>=76 years	**Absent**	32	100.0	

Table 2: Prevalence of tonsillolith according to age categories

Table 2 represents the Prevalence of tonsillolith according to age categories. There was a statistically significant difference among the different age categories (p<0.0001). The same has been graphically represented in Figure 3.

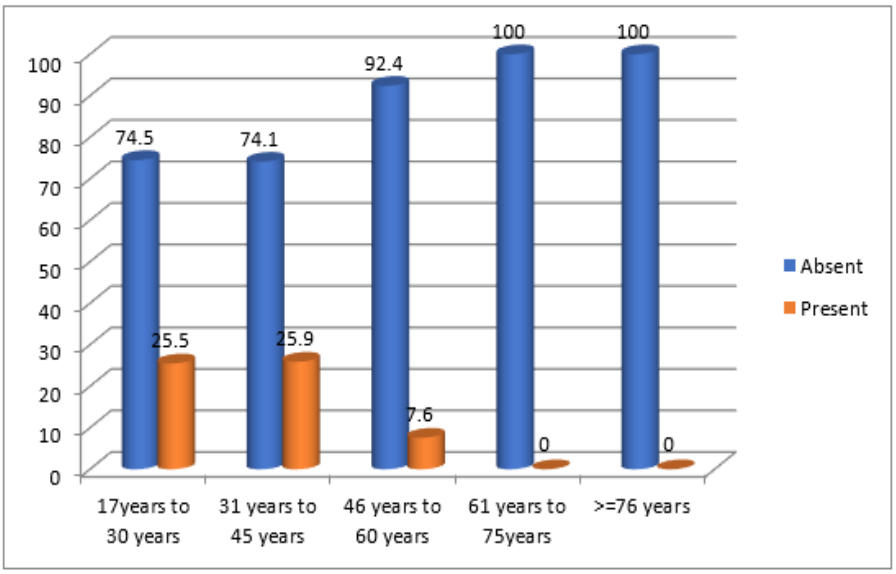

Figure 3: Graphical representation of the prevalence of tonsillolith according to age categories

Age		Frequency	Percent	Kruskal Wallis/ P-Value
17years to 30 years	**Absent**	137	74.5	32.32/<0.0001*
	Unilateral	36	19.6	
	Bilateral	11	6.0	
	Total	184	100.0	
31 years to 45 years	**Absent**	129	74.1	
	Unilateral	28	16.1	
	Bilateral	17	9.8	
	Total	174	100.0	
46 years to 60 years	**Absent**	61	92.4	
	Unilateral	2	3.0	
	Bilateral	3	4.5	
	Total	66	100.0	
61 years to 75years	**Absent**	44	100.0	
>=76 years	**Absent**	32	100.0	

*Statistically significant

Table 5: Prevalence of tonsillolith type according to age categories

Table 3 represents the Prevalence of tonsillolith type according to age categories. There was a statistically significant difference among the different age categories (p<0.0001). The same has been graphically represented in Figure 4.

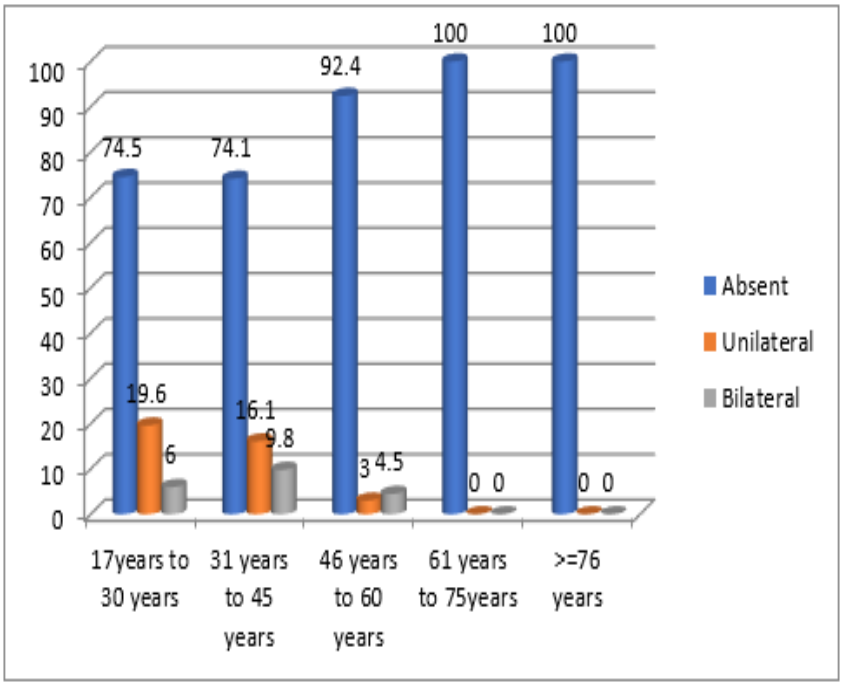

Figure 4: Graphical representation of the prevalence of tonsillolith type according to age categories

Age		Frequency	Percent	Kruskal Wallis/ P-Value
17years to 30 years	**Absent**	137	74.5	32.37/<0.0001*
	Single	33	17.9	
	Multiple	14	7.6	
	Total	184	100.0	
31 years to 45 years	**Absent**	129	74.1	
	Single	27	15.5	
	Multiple	18	10.3	
	Total	174	100.0	
46 years to 60 years	**Absent**	61	92.4	
	Single	2	3.0	
	Multiple	3	4.5	
	Total	66	100.0	
61 years to 75years	**Absent**	44	100.0	
>=76 years	**Absent**	32	100.0	

*Statistically significant

Table 4: Prevalence of tonsillolith number according to age categories

Table 4 represents the Prevalence of tonsillolith numbers according to age categories. There was a statistically significant difference among the different age categories ($p<0.0001$). The same has been graphically represented in Figure 5.

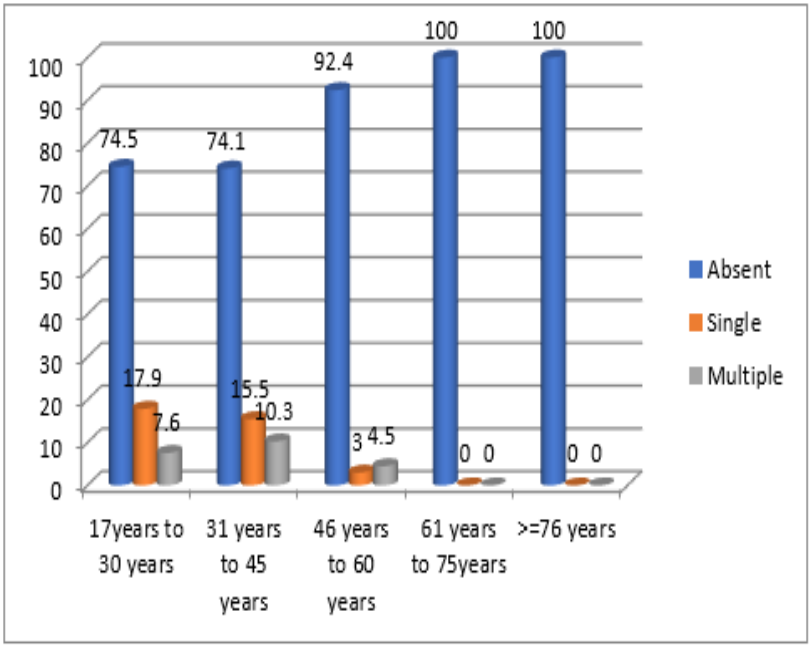

Figure 5: Graphical representation of the prevalence of tonsilloliths number according to age categories

3. Prevalence of the entire population

		Frequency	Percent
Tonsillolith	**Absent**	403	80.6
	Present	97	19.4
	Total	500	100.0
Type of Tonsillolith	**Absent**	403	80.6
	Unilateral	66	13.2
	Bilateral	31	6.2
	Total	500	100.0
Number of tonsilloliths	**Absent**	403	80.6
	Single	62	12.4
	Multiple	35	7.0
	Total	500	100.0

Table 6: Prevalence of the tonsillolith in the entire population

Table 6 shows the prevalence of the tonsillolith among the entire population. It was that 19.4% of them had the presence of the tonsillolith. For the type of tonsillolith, unilateral was reported by 13.2% of the study population and among 6.2% bilateral was seen. For the number of tonsilloliths, single tonsillolith was reported by 12.4% and multiple was reported by 7%. The same has been graphically represented in Figure 6.

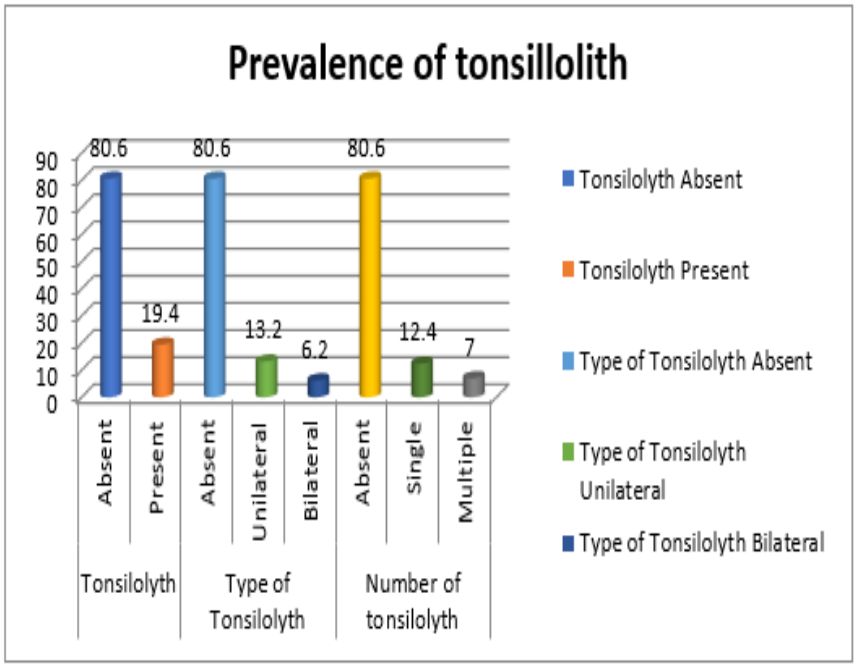

Figure 6: Graphical representation of the prevalence of tonsilloliths for the entire population.

DISCUSSION:

Even though the cause and pathogenesis of tonsilloliths are not known, the researchers believe that unresolved tonsillitis is the main factor. Meanwhile, many other authors have suggested that tonsilloliths developed as a result of stasis of the saliva in the efferent ducts of the accessory salivary glands secondary to mechanical obstruction arising from post-tonsillectomy scars or chronic inflammation. (9) Frequent episodes of inflammation may cause fibrosis at the openings of the tonsillar crypts, causing bacterial and epithelial debris accumulation which leads to retention cysts formation. Subsequent calcification due to deposition of inorganic salts and enlargement of the formed concretion take place gradually. Diagnosis of tonsilloliths will be confirmed through clinical presentation, examination, and imaging. In physical examination, enlargement and hardening of the tonsil is a common finding. On extraoral radiographs, these calcifications may be confused with other lesions such as a tooth, foreign bodies, salivary gland, and lymph nodes calcifications or stylohyoid ligament elongation. (5)

Sialoliths, lymph node calcification, and phleboliths are included in the differential diagnosis of tonsilloliths more frequently. Sialolithiasis (salivary calculi or salivary stones) is a calcified mass formed within a salivary gland, frequently in the duct of the submandibular gland (Wharton's duct). The parotid gland is less commonly involved; rarely do the sublingual gland or minor salivary glands develop salivary stones. (10) Sialoliths are usually accompanied by pain and swelling of the affected salivary gland. On coronal and axial tomographic images, parotid gland calcification is located on the exterior of the mandible.

Phleboliths are generally different and have a grouped dispersion. As often as possible they are related to haemangioma. Phleboliths likewise will generally be lamellated, while tonsilloliths are simply radio-opaque. (8)

The submandibular area is the normal site for calcification of lymph hubs which might be related to tuberculosis or other granulomatous infections. (11) Differential conclusions of atherosclerosis in carotid arteries from tonsilloliths might be of interest in light of the cardiovascular danger related to this entity. Luckily, the anatomic area of these two calcifications is unique. Tonsilloliths are typically superimposed over the ramus and dorsum of the tongue, while carotid atherosclerosis is generally found at the level of the third and fourth cervical vertebrae.

In this review, we utilized all-encompassing sees as a screening device. Even though more up-to-date modalities of imaging, for example, CBCT might be more exact and dependable in the conclusion of tonsilloliths; they couldn't be utilized in such epidemiologic investigations, since they are related to the significant expense and generally high portions of radiation to cases. (8)

The panoramic view is an easy-access imaging modality, with low-dose radiation, used in most dental procedures. (12) We used those panoramic radiographs, prepared for other dental purposes, without exposing the patients to unnecessary extra doses. (14)

Here noticed that there was no instance of tonsilloliths younger than 17 or more than 61 in the current review. This might show the age scope of this condition yet more likely maybe because of the inconsistent circulation of tests in various age bunches in the flow research. Future examinations are recommended to assess the commonness of tonsilloliths with equivalent examples in various age gatherings to decide the connection between age and tonsillolithiasis. At long last, the significance of cleanliness conditions and epidemiologic examples of sicknesses of ear, nose, and throat in various regions ought to be considered to clarify the disparity in the pace of tonsilloliths in various investigations. In case tonsillitis is viewed as a significant etiology for tonsillolithiasis, the previously mentioned variables will assume a part.

CONCLUSION:

The pervasiveness of tonsilloliths in the concentrated-on study populace was 19.04%. The vast majority of the cases were one-sided with more male inclination and under five in a person.

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