

## Short Communication

### Taurodontism in a central anatolian population

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#### ABSTRACT

The aim of this retrospective study was to evaluate the frequency of the occurrence of taurodontism in a Turkish population with using panoramic radiographs. A retrospective study was performed using full-mouth periapical and panoramic radiographs of 6912 patients (3860 females and 3052 males) ranging in age from 15 to 50. A total of 97362 posterior (including third molars) were evaluated. A chi-square test was used to determine the difference in the prevalence of taurodontism between genders. Eighteen patients were found to have a taurodont molar (10 women and 8 men [ $P = 0.98$ ]). The overall incidence of patients with taurodont molars was 0.26 % and the prevalence of taurodont molars from all teeth examined was 0.024%, and the prevalence taurodonts were significantly more common in the mandibula compared with the maxilla (71.0% cf 29.0% respectively,  $P < 0.05$ ). It was almost equally distributed between males and females. Taurodontism is not uncommon in Turkish population but further larger scale studies are required to assess its prevalence in the general population to compare it with other ethnic groups.

**Key Words:** Prevalance, taurodontism, Turkish

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#### INTRODUCTION

Dental anomalies are formative defects caused by genetic disturbances during tooth morphogenesis.<sup>[1]</sup> One of the most important abnormalities in tooth morphology is taurodontism. Witkop defined Taurodontism as “teeth with large pulp chambers in which the bifurcation or trifurcation are displaced apically”, so that the chamber has greater apico-occlusal height than in normal teeth and lacks the constriction at the level of cemento-enamel junction (CEJ).<sup>[2]</sup> The distance from the trifurcation or bifurcation of the root to the CEJ is greater than the occluso-cervical distance. This localized disorder was labeled as taurodontism because of its appearance of or a similarity to a bull’s head with horns on X-ray, hence named after Taurus the bull.<sup>[3]</sup> It also has been found to mimic the molar of cud-chewing animals.

In diverse populations, taurodontism can be considered simply a variation of normal. The objective of this study was to assess the frequency of taurodontism in the posterior teeth of the Turkish population by radiographic analysis and to compare the results with published data in different population groups.

#### MATERIALS AND METHODS

Panoramic radiographs from 6912 patients (3,860 women and 3052 man, mean age: 29.04 years range 15 to 50 years) attending Kirikkale University Dental Faculty Hospital during the period from July 2009 to August 2011 were reviewed for the presence of taurodontism. Radiographic interpretation was by two experienced examiners. Exclusion criteria included patients who were less than 15 years of age at the time of radiographic examination, records with poor quality radiographs and records with radiographs of only primary teeth.

A tooth with an apically displaced pulp chamber which did not show the usual constriction of the pulp at the cemento-enamel junction (CEJ) and had an apically displaced furcation area was considered as a taurodont.

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Statistical analysis of the data was done using the Statistical Package for the Social Sciences (SPSS 15.0). Chi-square test was also used to compare

the prevalence of taurodontism between male and female subjects and upper and lower jaws.

**Table 1: Distribution of taurodont teeth among 6912 patients, in the maxilla and mandible by tooth type**

Tooth type	Taurodont teeth					
	Maxilla		Mandibula		Total	
	No.	%	No.	%	No.	%
First premolar	0	0	2	4,34	2	4,34
Second premolar	0	0	2	4,34	2	4,34
First molar	4	8,7	10	21,7	14	30,4
Second molar	10	21,7	16	34,8	26	5,65
Third molar	0	0	2	4,34	2	4,34
Total	14	30,4	32	69,5	46	49,1

## RESULTS

Six thousand nine hundred and twelve patients, 3860 women and 3052 men between the ages of 15 and 50 years (average,  $29.04 \pm 8.68$  years) were considered in this study; 97362 posterior teeth (including third molars) were evaluated. Maxillary posterior teeth comprised 49020 teeth and mandibular posterior 48,342 teeth. Eighteen patients were found to have a taurodont teeth (10 women and 8 men [ $P = 0.98$ ]). Forty-two patients were found to have taurodont molar. Taurodontism was detected in

**Table 2: Survey of available studies on the prevalence of taurodont molars**

Population	Authors	Year	Tooth type	Individuals	Incidence (%)	Study type
American (blacks and whites)	Blumberg <i>et al.</i> <sup>[13]</sup>	1971	Mandibular molars	11,095	2.5	Biometric study
American	Witkop <i>et al.</i>	1988	Posterior teeth	2,8	2.5-3.2	Panoramic radiographs
American (European origin)	Keene <sup>[14]</sup>	1966	Molars	247	3.2	Morphologic and biometric study
Israeli	Shifman and Chanannel <sup>[7]</sup>	1978	Molars	1200	1.5	Periapical and bitewing radiographs
British	Holt and Brook <sup>[15]</sup>	1979	Mandibular first molars	1,115	6.3	Panoramic radiographs
Iranian	Ezoddini <i>et al.</i> <sup>[16]</sup>	2007	Posterior teeth	480	7.5	Panoramic radiographs
Jordanian	Darwazeh <sup>[5]</sup>	1998	Posterior teeth	875	8	Periapical radiographs
Saudi Arabian	Ghaznawi <sup>[17]</sup>	1999	Posterior teeth	1,010	22494	Panoramic radiographs
Australian	Thongudomporn	1998	Posterior teeth	111	9.9	Panoramic radiographs
Dutch	Schalk van der Weide <i>et al.</i>	1993	Mandibular first molars	91 (normal)	9.9 (normal)	Panoramic radiographs
Saudi Arabian	Ruprecht <i>et al.</i> <sup>[18]</sup>	1987	Molars	1,581	8.61-11.3	Panoramic and periapical radiographs
Senegalese (15-19 y)	Toure <i>et al.</i> <sup>[19]</sup>	2000	First and second molars	150	48	Panoramic radiographs
South African	Shaw <sup>[9]</sup>	1928	Molars	147	30	Radiographic, morphologic, and biometric study
Chinese (14-19 y)	Mac Donald-Jankowski and Li <sup>[6]</sup>	1993	First and second molars	196	46.4	Panoramic radiographs
Premolars				1,093*	21.7*	
Brazilian	Madeira <i>et al.</i> <sup>[20]</sup>	1986	Premolars	4,459*	0.25	<i>In vitro</i> study (anatomic and radiographic)
Spanish	Llamas and Jimenez-Planas <sup>[21]</sup>	1993	Premolars	379	0.79	<i>In vitro</i> study (anatomic and radiographic)
Trinidad and Tobagonian	Pillai <i>et al.</i> <sup>[22]</sup>	2007	Premolars	1,09	47058	Periapical and panoramic radiographs
Turkish	Çelikoğlu <i>et al.</i> <sup>[11]</sup>	2010	Molars and premolars	5,324*	4.79*	radiographs
				1324	4.5	Panoramic radiographs

\*Teeth

only four premolars (two mandibular first premolars and two mandibular second premolars). The overall incidence of patients with taurodontism was 0.26% (0.26% for women and 0.26% for men). The distribution of taurodontism among different teeth in the upper and lower arches is shown in Table 1. Taurodonts were significantly more common in the mandibula compared with the maxilla (71.0% cf 29.0% respectively,  $P < 0.05$ ). The prevalence of taurodont molars among all teeth examined was 0.047% (0.043% for molars, 0.004% for premolars). The mandibular second molar was the most common tooth involved followed by the mandibular first molars. The distribution and the incidence are given in detail in Table 1. Radiographically, all these teeth showed no signs of a previous root canal treatment or apical periodontitis.

## DISCUSSION

Taurodontism is a morphologic change generally occurring in multirouted teeth characterized by wide elongated pulp chambers and apical floor displacement.<sup>[4]</sup> The incidence of taurodontism has been reported to be highly variable in different populations. The prevalence of taurodontism was reported to be 8% in a Jordanian,<sup>[5]</sup> 46.4% in a young adult Chinese,<sup>[6]</sup> 5.6% in an Israeli people,<sup>[7]</sup> 9.9% in a Dutch<sup>[8]</sup> and 33-41% of certain African populations<sup>[9]</sup> In our study, the prevalence of taurodont teeth was found to be 0.26%. This finding is in agreement with a previous study conducted in seven-year-old Swedish children.<sup>[10]</sup> The prevalence in the Turkish population was reported to be from 4.5% to 7.4% in some studies<sup>[11,12]</sup> which were markedly higher than from our findings. Discrepancies in the same population may be explained by regional differences and number of study samples. In other studies assessing the prevalence of taurodontic teeth in different ethnic groups, much higher incidences were reported [Table 2]. The wide variation in reported prevalence may be explained by the different cohorts studied, geographical differences and differences in criteria used for interpretation of taurodontism and also the specific teeth examined.

The present study should be considered with caution as it may not be representative for the overall Turkish population. Nonetheless the findings form a basis for further studies.

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