

Klinefelter's syndrome and taurodontism

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Summary *Objective: Taurodontism is a dental anomaly characterized by an enlarged pulp chamber and apical displacement of the pulpar floor. The prevalence of taurodontism in normal population is controversial. It has been reported that taurodontism is frequently observed in Klinefelter's patients. The purpose of this study was to assess the prevalence of taurodontism in a group of Italian Klinefelter's patients and in a randomly selected male population of Italy and to compare the results with published data. Materials and methods: Digital panoramic radiographs of 16 Klinefelter's patients and of 100 normal males were retrospectively studied in order to investigate the prevalence of taurodontism in these groups of patients.*

Results: Taurodont teeth were observed in 2 of the 16 Klinefelter's patients (12.5%) and in 2 of 100 normal males (2.0%).

Conclusions: Our results confirm the higher prevalence of taurodontism in Klinefelter's patients compared to the normal population (12.5% vs. 2.0%). Due to the wide discrepancy of incidence of taurodontism reported in literature (0.04%-48.0% in normal population; 12.5%-88.0% in Klinefelter's patients), we conclude that it is not possible to state which is the prevalence of taurodontism in a normal population nor among Klinefelter's patients.

KEY WORDS: Klinefelter's syndrome; Taurodontism; 47,XXY; Dental anomaly; Digital panoramic radiographs.

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INTRODUCTION

Taurodontism is defined as a change in the shape of molar teeth characterized in an enlarged pulp chamber, apical displacement of pulpar floor and no constriction at the level of cemento-enamel junction (1).

The origin of the word comes from the Greek *tauros*, which means bull and *odontos* which refers to tooth ("bull-like" teeth).

The prevalence of taurodontism in normal population has been reported to range between 0.04% (2) and 48.0% (3). An increased incidence of taurodontism has been observed in Klinefelter's patients with a prevalence of 19.4% (4) to 88.0% (5). The purpose of this study was to assess the incidence of taurodontism in a group of Italian Klinefelter's patients and in a randomly selected male population of Italy and to compare the results with published data of different normal population groups and of Klinefelter's patients.

PATIENTS AND METHODS

We retrospectively studied the digital panoramic radiographs of 16 Klinefelter's patients who attended the "Ambulatorio Klinefelter" in Italy in order to investigate the prevalence of taurodontism in this group of patients. Orthopantomograms of 100 randomly selected patients of the same male Italian population were examined as a control group. Dental radiographs were analyzed for the presence of taurodontic molars using the categorization hypo-, meso-, and hyper- taurodont based on the degree of apical displacement of the pulp chamber floor. A tooth was considered as taurodont when there was an enlarged pulp chamber that was apically displaced and a lack of constriction at the cemento-enamel junction (5).

RESULTS

Of the 16 Klinefelter's patients, 2 were found to exhibit taurodontic teeth (1 hypo and 1 meso-taurodont) (12.5%) (Figure 1). In the group of 100 normal patients we found 2 patients with taurodontic teeth (2 meso-taurodont) (2.0%).

DISCUSSION

Clinically, a taurodont tooth appears as normal: its distinguishing features cannot be recognized clinically, therefore the diagnosis is made from radiographs. Several criteria have been proposed to define a taurodont tooth, each of them having pros and cons (1, 5-8). Moreover, most Authors do not provide an objective analysis of cases presented, preferring a subjective diagnosis (1). It has been stated that the incidence of taurodontism is very low in normal population (8-10), others claim that taurodontism is not a rare trait in the modern man (5). Some Authors report that taurodontism is the most common dental anomaly observed (11), others even consider taurodontism a simple variation of normal teeth (12). The prevalence of taurodontism has been reported to show a wide range of discrepancy in different populations. It was 0.04% in an Italian population (2), 1.4% in children of Saudi Arabia (13), 2.25% in a German population (14), 2.5% in a Finnish population (15), 5.6% in young adult Israeli patients (6), 15.06% in a French population of 551 patients (where it was the most common dental anomaly observed) (11), 22.9% in an Iranian population (7), 46.4% in a young Chinese

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Figure 1.

Radiograph of a taurodontic molar in a Klinefelter's patient with enlarged pulp chamber, apical displacement of the pulpar floor and lack of constriction at the level of the cemento-enamel junction.



population (16) and 48% in a black Senegalese population (3). The prevalence of taurodontism that we have found in our group of 100 normal patients was 2.0%. It has been claimed that the wide discrepancy observed could be due to racial variations (17), but the inconsistency of prevalence observed in studies exploring the same populations (0.4% of 4143 patients (9, 18) and 2.8% of 1000 patients (19) in two north Indian populations and 0.26% of 6912 patients (12) and 11.2% of 1200 patients (20) in two Turkish populations) seems to indicate that the differences reported can be rather due to different criteria used to define taurodontism rather than ethnic variations.

An increased prevalence of taurodontism has been reported in Klinefelter's patients. The prevalence observed was 19.4% of 31 Klinefelter's patients (4), 24% of 25 patients (21), 30% of 30 Finnish 47,XXY males (15), 40% of 35 Klinefelter's patients (22), 75% of 24 patients (23), 88% of 9 Klinefelter's patients (5).

The prevalence of taurodontism that we have found in our group of 16 Klinefelter's patients (12.5%) appears to be lower than what observed in other Klinefelter's populations.

Taurodontism seems to be associated with several other syndromes such as Down's syndrome (24), 48,XXYY syndrome (25), Prader-Labhart-Willi syndrome (26), Wolf-Hirschhorn syndrome (27-28), Pierre Robin syndrome (29); it is also more frequent in familial groups (5, 8), in families with WNT10A defects (30) and it is a typical trait frequently found in Neanderthal teeth (17).

CONCLUSIONS

Our results confirm the higher prevalence of taurodontism in Klinefelter's patients compared with the prevalence observed in a normal population (12.5% vs. 2.0%). The wide discrepancy of incidence of taurodontism reported in literature (0.04%-48.0% in normal popula-

tion; 12.5%-88.0% in Klinefelter's patients) does not allow to determine which is the prevalence of taurodontism in a normal population nor the prevalence among Klinefelter's patients.

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