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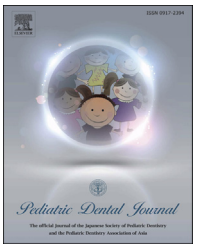

Original Article

Time and sequence of eruption of permanent teeth in Ankara, Turkey

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ABSTRACT

Introduction: The aim of this study was to determine time and sequence of eruption of permanent teeth in addition to caries status and gender differences in children and young adolescents in Ankara.
Materials and methods: Cross-sectional data were collected by examining a total of 890 (407 female and 483 male) pre-school, primary and secondary school children of 5–15 years of age. The mean age of eruption and caries status of individual permanent teeth were recorded. Data were statistically evaluated with sample T-Test and One-way ANOVA.
Results: Eruption tended to be earlier in girls than boys in most of the groups accept for the teeth 44. The sequences of eruption of permanent teeth were 6-1-2-4-3-5-7 in mandible, and 6-1-2-4-5-3-7 in maxilla in boys whereas 1-6-2-3-4-5-7 in mandible, and 6-1-2-5-4-3-7 in maxilla in girls. Increased caries prevalence was seen both in primary and permanent teeth.
Conclusion: When compared with the other studies, eruption times show differences which were affected by genetics, genders, ethnicity, nutrition, fluoridation, carious condition, premature extraction of predecessors, socioeconomic variables, congenital anomalies and the changes in eruption time is significant when planning dental treatments.

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1. Introduction

Human beings have two sets of natural teeth, the primary and permanent dentition [1]. The eruption of the teeth encompasses the entire process starting with embryonic development of the tooth bud in the jaw, including the formation of the crown and the root, emergence to the oral cavity, encounters with the opposite arch tooth and begins function in occlusion (reaches occlusal plane) [2–5]. The emergence of the teeth in oral cavity is called eruption. Eruption times of these teeth are important for pediatric dentists, orthodontists, oral pathologists, oral surgeons as well as others like, anthropological, paleontological studies and forensic applications [6]. It is also of particular importance for pediatric dentists, orthodontists and general practitioners for a thorough diagnosis, treatment planning, preventive and therapeutic interventions [1].

Eruption of teeth is affected by many factors. Genders, ethnicity, nutrition, fluoridation, carious condition, premature extraction of predecessors, socioeconomic variables, congenital anomalies has effects on eruption times. Gender is one of the factors that plays a role in eruption and many studies have declared that boys' tooth appear to erupt slightly ahead [6–10] while the others declared opposite [4,6,7,11–13].

Ethnicity and geographic variation leads to differences in eruption times. It was reported that French Polynesian children's permanent molar teeth erupted earlier than European encounters. Cook Island children's teeth erupted earlier than European and Asian children [13]. African black children's teeth erupted earlier than Caucasian and Asian counterparts [12].

Carious condition and premature extraction has effects on permanent teeth eruption and the early loss of primary teeth because of caries, failure in root canal treatments, abscess or swelling (especially in primary molars and canines) may cause early eruption of its predecessor [12].

There are limited data on the timing and sequence of eruption of teeth from Turkey. Keeping the importance of the eruption time of permanent teeth for all dental practitioners in mind, the aim of this study was to determine time and sequence of eruption of permanent teeth in addition to caries status and gender differences in children and young adolescents in Ankara, Turkey.

2. Materials and methods

2.1. Population and samples

This study was carried out in Ankara, which is the capital city of Turkey located in the central region of Anatolia. One school randomly was selected from the northeast of Ankara. The children were aged between 5 and 15 years. The classification were made according to date of birth that were taken from the school teachers/administers and the age of children were between 71 and 173 months. There were 890 children and 407 were girl (45.7%) and 483 (54.3%) boy. The children have no systemic or chronic diseases if so they were planned to exclude from the study.

2.2. Interviews and oral examination

The oral examination was performed by five trained pediatric dentists. Inter-examiner and intra-examiner consistencies were evaluated by kappa values based on double measurements of 30 cases. Children with congenital anomalies, with history of any systemic disease and those undergoing orthodontic treatment were excluded from the study. The children were informed regarding the procedure and oral examinations were performed only after they were assured. The examination was done in the classrooms while the child was sitting on a classroom chair. A plain mouth mirror and a probe were used under normal daylight. The oral examination started from the maxillary right quadrant for the presence of permanent teeth followed by the maxillary left, mandibular left, and mandibular right quadrant. The tooth was recorded as 'present' or 'absent'. 'Present' was recorded when any part of its crown had penetrated the mucous membrane. A tooth with any of its parts emerged through the gingiva was considered as erupted. When in doubt, the area was dried with cotton to confirm the eruption [7]. Only permanent teeth were recorded. A standard mouth diagram was used to collect data including date of birth, age, sex, and the eruption chart. The information regarding caries was recorded as a tooth with a carious lesion or sound. Date of birth and sex were taken from the school register. The age was calculated in months from each child's date of birth to the date of the examination.

2.3. Statistical analysis

Independent sample T-Test and One-way ANOVA were used to detect the differences and correlations between eruption times of the teeth, caries and if these were affected by genders. Inter- and intraexaminer Kappa values were calculated. The level of significance was set at 5%.

3. Results

There were 890 children and 407 were girl (45.7%) and 483 (54.3%) boy. The boys were between 77 and 162 months and the girls were between 71 and 173 months. The ages and the percentages for both boys and girls were seen in Table 1.

The interexaminer consistencies between five dentists varied from 0.85 to 1.00. The intra-examiner consistencies

Table 1 – The number of boys and girls in ages with percentages.

Ages	Boys (n)/percentage (%)	Girls (n)/percentage (%)
7	65 (13.5)	54 (13.3)
8	85 (17.6)	58 (14.3)
9	67 (13.9)	66 (16.2)
10	88 (18.2)	58 (14.3)
11	61 (12.6)	64 (15.7)
12	72 (14.9)	71 (17.4)
13	42 (8.7)	32 (7.9)
14	3 (0.6)	2 (0.5)
15	–	2 (0.5)