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Research Article

### ASSESSMENT OF ERUPTION OF PERMANENT TEETH AND ITS RELATION WITH BMI AMONG LOCAL POPULATION OF PAKISTAN

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**Abstract:**

**Introduction:** Tooth eruption is the movement of a tooth from its position in the osseous crypt into the oral cavity. **Objectives of the study:** The main objective of the study is to analyse the eruption of permanent teeth and its relation with BMI among local population of Pakistan. **Methodology of the study:** This cross sectional study was conducted in Government City Hospital Talagang during October 2018 to March 2019. The data was collected from 100 participants. Basic information such as educational level, date of birth, place of birth and family history was asked to the patients. The data was collected through a designed questionnaire. BMI was calculated by the formula given below, but first we took the height and weight of the selected participants. **Results:** The data was collected from 100 participants. Maxillary lateral incisor was seen to be the most delayed tooth with 51.7% delayed eruption in right max lateral incisor and 48.4% delay in the eruption of max left lateral incisor. Since the sample size was small so we cannot claim that every child will have delayed eruption in maxillary lateral incisor. 2nd premolar of the right arch was also delayed where 41.5% children had delayed eruption. **Conclusion:** It is concluded that almost all teeth had slight delayed eruption according to the normal eruption dates but since the sample size was small so we cannot conclude that every child in our region will have delayed eruption.

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**INTRODUCTION:**

Tooth eruption is the movement of a tooth from its position in the osseous crypt into the oral cavity. Although the exact mechanisms underlying this process are not entirely known, many factors appear to play a role. Demographic factors, such as race, sex, and age may influence the process. Physiologic factors thought to be involved include molecular signalling and several hormones and mediators that affect growth. Growth of the mandible is known to be influenced by pubertal timing [1]. Deciduous tooth eruption may be altered in conjunction with certain systemic disorders, such as diabetes mellitus and congenital abnormalities. Alterations in the timing of tooth eruption can significantly impact oral health due to its potential to cause malocclusion (the improper positioning of the teeth and jaws) and/or crowding, which may in turn lead to poor oral hygiene and periodontal disease. In addition, the length of time a tooth is present in the oral cavity affects its risk for dental caries [2]. Furthermore, sequencing of eruption may impact occlusion which may have consequences for periodontal and temporomandibular joint disorders.

Eruption time of the teeth and order are essential aspects in treatment planning, mainly when patients require orthodontic treatment, it also plays a pivotal role in forensic dentistry as it can help to find the age of an adolescent [3]. Exfoliation of primary teeth and in turn the eruption of new teeth, is a constant age-related progression by which the teeth arise through the upper and lower jaws and the overlaying mucosa to enter into the oral cavity and in turn occlude with the teeth of the opposite arch.

The permanent teeth usually emerge between the ages of 6 -14 years, not including the 3rd molars that usually are seen emerging at the ages of 17-21 years. As teeth are the most stable structures in the human body, it can be of paramount importance in forensic medicine where estimation of age is usually required for criminal investigations and also in persons who do not have proper birth certificates whether above or below 18 years of age [4]. Body Mass Index (BMI) is a reliable table for measurement of obese people and for those who are overweight especially teenagers and small kids. BMI is reliant on age and

gender in kids and teenagers and is for the most part stated to as particular for a specific age but, no sound research has been performed in Pakistan on the assessment of eruption of permanent teeth according to age and its relation with body mass index [5].

**Objectives of the study**

The main objective of the study is to analyse the eruption of permanent teeth and its relation with BMI among local population of Pakistan.

**METHODOLOGY OF THE STUDY:**

This cross sectional study was conducted in Government City Hospital Talagang during October 2018 to March 2019. The data was collected from 100 participants. Basic information such as educational level, date of birth, place of birth and family history was asked to the patients. The data was collected through a designed questionnaire. BMI was calculated by the formula given below, but first we took the height and weight of the selected participants. In adequate light, clinical examination was carried out using a wooden spatula to retract soft tissue, and the status of eruption of the permanent tooth was recorded. Any part of the tooth emerging or erupting in the oral cavity was considered as an eruption of tooth.

**Statistical analysis**

The data was collected and analysed using SPSS version 20.0. The results were analysed using the Pearson Chi-square test with the level of significance set as  $P < 0.05$ .

**RESULTS:**

The data was collected from 100 participants. Maxillary lateral incisor was seen to be the most delayed tooth with 51.7% delayed eruption in right max lateral incisor and 48.4% delay in the eruption of max left lateral incisor. Since the sample size was small so we cannot claim that every child will have delayed eruption in maxillary lateral incisor. 2nd premolar of the right arch was also delayed where 41.5% children had delayed eruption. According to the international BMI standards, children with BMI below 5% of standard were considered as thin or underweight, between 5% - 85% as normal and above 85% as obese.

**Table 01:** Age and its relation to BMI and eruption of teeth

Maxillary Teeth	No of cases	Erupted on normal time	Not erupted on normal time	% OF NORMAL ERUPTION
11	44	29	15	65.9
12	60	29	31	<b>48.3</b>
13	61	42	19	68.8
14	154	111	43	72.0
15	152	89	63	<b>58.5</b>
16	44	36	8	81.8
17	61	53	8	86.8
21	44	28	16	63.6
22	60	31	29	<b>51.6</b>
23	61	38	23	62.2
24	154	110	44	72.3
25	152	93	59	61.1
26	44	36	8	81.8
27	61	51	10	83.6

**Table 02:** Distribution of children on the basis of gender and mean eruption age in each group.

Gender	Number	Mean Chronological Age	Mean Eruption Age	Standard deviation
Boys	30	9.5	9.7	1.85
Girls	70	10.6	9.5	1.88

**DISCUSSION:**

Tureli and coworkers studied the relationship between state of mastication and dental changes and BMI in 97 children aged 8 - 12 years old. The dental state, BMI and socio-economical status of the population under study were evaluated and they concluded that children with normal weight have better mastication compared to children with above normal BMI. State of weak mastication had a significant relationship with decrease in weight and position of the permanent teeth in children with normal weight [6].

Body Mass Index (BMI) is a reliable scale for measurement of obese people and for those who are overweight especially teenagers and small kids. Obesity in kids can cause skeletal complications in the head and neck area [7]. BMI is reliant on age and gender in kids and teenagers and is for the most part stated to as particular for a specific age [8].

Hilgers K. K. studied the effect of children obesity on dental development and concluded that children with increase in weight and/or increase in BMI have increased dental development even if they are evaluated in relation to the age and sex of the child [9]. This increased dental development is considered as an important variable in pediatric dentistry and orthodontic treatment [10].

**CONCLUSION:**

It is concluded that almost all teeth had slight delayed eruption according to the normal eruption

dates but since the sample size was small so we cannot conclude that every child in our region will have delayed eruption.

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