



# Relationship between gestational age, birth weight and deciduous tooth eruption



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## KEYWORDS

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**Abstract** *Background:* Teething is a normal part of child growth and development. Growth parameters and feeding pattern may be determinants of the timing of teeth eruption in healthy infant. Primary tooth eruption may be affected by gestational age, postnatal nutrition, degree of prematurity as well as severity of neonatal illness.

*Objectives:* The aim of this study was to evaluate the relation between gestational age, weight and neonatal illness to the time of eruption of the first deciduous tooth.

*Materials and methods:* This study was a follow up prospective study carried out at the Bab El Sharia University hospital from October 2010 to October 2012. The study included 250 newborn from the obstetric department, from the NICU and from the outpatient clinics at the hospital. The babies were stratified according to gestational age to preterm (< 37 weeks): 72 cases and full term (> 37 weeks): 178 cases. The babies were followed from birth till the eruption of the first deciduous tooth.

*Results:* There was a negative linear correlation between the time of the first deciduous tooth eruption and birth weight. The eruption of the first deciduous tooth was delayed in babies admitted to NICU specially if there was major interference such as intubation, mechanical ventilation.

*Conclusion:* Delayed tooth eruption was related to lower birth weight and prematurity. The delayed eruption in preterm babies may be related to premature birth and not to a delay in dental development.

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## Introduction

The time of formation, calcification and eruption of the deciduous teeth is subjected to several individual variations.

Nevertheless, under normal conditions, the time, sequence and chronology of the biological events follow a regular cycle. This process may be disrupted in preterm infants by nutritional deficiencies, exposure to certain medicaments and traumatic oral manipulations.<sup>1</sup>

Growth parameters and feeding pattern may be determinants of the timing of teeth eruption in healthy infant.<sup>2</sup> Some studies suggest that primary tooth eruption is related primarily to gestational age and severity of neonatal illness, postnatal

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nutrition as well as the degree of prematurity. Other studies reported that the eruption pattern in primary dentition is related to low and normal birth weight.<sup>3</sup>

Premature and low birth weight babies can have delayed primary tooth eruption and enamel defects, putting them at higher risk for decay later on.<sup>4</sup>

The process of teething can be a difficult time for both the child and parents. When new teeth pierce or erupt from the gums, discomfort, pain and fussiness can result.<sup>5</sup>

Teething usually begins between 4 and 9 months and most babies will have their first tooth by their first birthday. However, every baby is different and the start and duration of the teething process can vary greatly between individuals. Around one in 2000 babies is actually born with one tooth or two already and are called natal teeth, while others do not show any until they are 12 months. There is no need to worry if infant's teeth appear particularly early or late, the timing are not believed to be any indication whether the infant is developing well, either physically or mentally.<sup>6</sup>

Tooth eruption is a series of metabolic events in alveolar bone characterized by bone resorption and formation on opposite sides of the dental follicle and the tooth does not contribute to this process.<sup>7</sup>

Tooth eruption is influenced by pituitary growth hormone, thyroid hormone and parathyroid hormone-related protein; all are required for normal tooth eruption.<sup>8</sup>

Certain vitamins and hormone deficiencies, if present during tooth formation will adversely affect formative cells and the matrix they produce. Reduced organic matrix content may result in production of hypoplastic tissue. A hypoplastic matrix that is also hypomineralized would result.<sup>7</sup>

### Aim of the study

The aim of this study was to evaluate the relation between gestational age, birth weight, neonatal illness and the eruption time of the first deciduous tooth.

### Patients and methods

This study was a follow up prospective study. It was carried out in the Bab El Sharia University hospital from October 2010 to October 2012, the study included 250 newborn from the obstetric department, NICU and from the outpatient clinics at the hospital. They were selected by a simple random method. The babies were stratified according to:

- Gestational age:  
Preterm (< 37 weeks): 72 cases and full term (> 37 weeks): 178 cases.
- Birth weight into 3 groups:  
Very low birth weight (VLBW) (< 1.5 kg): 32 cases.  
Low birth weight (LBW) (1.5–2.5 kg): 38 cases.  
Normal birth weight (NBW) (> 2.5 kg): 180 cases.

The babies were followed up from birth till the eruption of the first deciduous tooth.

### Inclusion criteria

- Gestational age from 30 to 42 weeks.
- Birth weight from 1200 g.
- No symptoms or signs of endocrinal disease e.g. Hypothyroidism.

### Exclusion criteria

Any newborn with bone disease especially osteopenia of prematurity, genetic disease or congenital malformations were excluded from the study.

For each newborn the following were collected:

- (A) Detailed history and oral examination  
This was done by frequent oral examination (inspection and palpation) with good illumination carried out by the pediatrician with consent of the parents.
- (B) Recording of these data
  - Gestational age, birth weight, sex, mode of delivery, multiple pregnancies, maternal illness, NICU admission (if present).
  - Types of feeding since birth
  - Any significant illness since birth.
  - Vitamin D intake and its dose.
  - Family history of delayed teething.
  - Which tooth erupted first.

Follow up of these infants from the 3rd month till the eruption of the first deciduous tooth was done weekly on regular medical visits. The study received ethical approval from the ethics committee of Al Azhar faculty of Medicine.

Some definitions were taken into consideration:

Chronological age = from moment of birth

Corrected age = gestational age + chronological age

### Statistical analysis

Statistical analysis was performed with Epi – info software, version 6.04 in public domain. Descriptive statistics including the mean and standard deviation for each group was calculated. Descriptive analysis of the presented data was used through tables. For comparison of data, correlation with the eruption of the first deciduous tooth, the parametric Student's *t* test and non-parametric ANOVA test were used for independent samples. The minimum significant level adopted was 5% (0.05).

### Results

The study included 122 (48.8%) males and 128 (51.2%) females. The gestational age of the studied groups (mean  $\pm$  SD) were  $36.5 \pm 2.82$  weeks. Their birth weights were  $2.77 \pm 0.96$  kg. Further demographic data of the studied groups ( $n = 250$ ) are presented in [Table 1](#).

The mean eruption in full term was  $7.97 \pm 2.62$  months while it was  $9.32 \pm 1.48$  in preterm infants. There was a high

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