

Effect of Developmental Milestones on Patterns of Teeth Eruption

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Abstract

Introduction: Developmental milestones are a set of functional skills or age-specific tasks that most children can do at a certain age range. The milestones help to check how a child is developing. Keeping in mind the importance of the developmental milestones and the teeth eruption patterns in a child's life, a study was designed.

Materials and Methods: The study was cross-sectional in nature and conducted among four to thirty 6 months old children selected from the government and private hospitals of Bhopal city, Madhya Pradesh, India. This study comprises a total of 1601 subjects from both sexes. The cases were taken from the outpatient departments of government and private hospitals in Bhopal city. The questionnaire collected information on demographic details and milestones of children were examined as per the American Academy of Pediatric Dentistry development chart of milestones. Statistical analysis was done using Statistical Package for Social Science.

Result: It was observed that teeth eruption was delayed in children irrespective of the milestones whether it was delayed or normal.

Conclusion: No significant correlation was observed between developmental milestones and tooth eruption.

Key words: Delayed eruption, Growth, Milestones, Teeth eruption

INTRODUCTION

Evolution of the human race has seen many changes in the living habits, food habits, and oral hygiene habits over a span of thousands of years which may have influenced the eruption of teeth as well. Tooth eruption is recognized as an aspect of human growth, and development could possibly be influenced by number of factors which can be both physiological and pathological like growth, caries, malnutrition, genetics, etc.¹

“Oral health is integral to general health and should not be interpreted as separate entities. Oral diseases are progressive and cumulative and become more complex over time. They

can affect our ability to perform our day to day activities. These diseases can also affect economic productivity.” A healthy oral cavity is important in a growing child, as it helps to develop good speech, healthy eating habits, and good social skills.²

Developmental milestones are some specific skills or age-specific tasks that most children can do at a certain age range. The stages help to check how a child is developing.³

According to Bailey, the parents should watch for the early childhood milestones, along with the more obvious “firsts” such as walking and talking. They should compare the child with peers or older siblings. Each child is an individual. Children can achieve a particular milestone during a wide range of time. For example, children may walk as early as 9 months or as late as 14 months.³

Most babies have their first tooth at around 6 months. But, the baby may have his first tooth, anytime between 3 months and his first birthday, although it can come as

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late as 14 months.⁴ The last teeth, which are the second molars are usually in place by the 2nd year of life. So, by the child's third birthday, he/she should have a full set of 20 primary teeth.⁴

Today, children are maturing earlier than they did at the beginning of this century and moreover, they are growing faster than their grandparents and great grandparents. Various studies have shown that an analogous correlation between skeletal and dental maturity, as is found in the relationships among growth, skeletal, sexual, and somatic maturation, does not exist.⁵

Correlation studies using dental emergence or dental formation criteria promote the concept of dental age estimation as a maturity indicator, especially with regard to chronological age. In one of the study on the inter-relationship of somatic growth variables and chronological, dental and skeletal ages concluded that there is a high correlation between dental and chronological age.⁶

Relationship between the eruption of deciduous teeth and child's development has been widely studied. However, the process being greatly influenced by genetic, ethnic, racial factors, and geographical location; growth data, derived from studies on a group of people of different genetic pools and living under different environmental conditions are inappropriate for evaluating developmental level of children residing in other geographical locations.¹

Keeping in mind the importance of the developmental milestones and the teeth eruption patterns in a child's life, a study was designed to evaluate and compare the homogeneity in the patterns of developmental milestones and dental eruption.

MATERIALS AND METHODS

The study was cross-sectional in nature and conducted among four-thirty 6 months old children selected from the government and private hospitals of Bhopal city, Madhya Pradesh, India. Prior to the survey, permission to conduct the research and ethical clearance was obtained. This study comprises a total of 1601 subjects from both sexes. Selected cases were from outpatient departments of government and private hospitals in Bhopal city. The data collection was done by a single trained and calibrated investigator to avoid inters-examiner variability. A survey proforma and questionnaire with closed-ended questions were designed to collect reliable well-defined information from parents. Milestones of children were examined as per the American Academy of Pediatric Dentistry

development chart of milestones (Table 1). Information regarding the demographic details of the child was noted. Using Statistical Package for Social Science (SPSS Version 20; Chicago Inc., USA), data comparison was done by applying specific statistical tests. Significance level was fixed at $P < 0.05$.

RESULTS

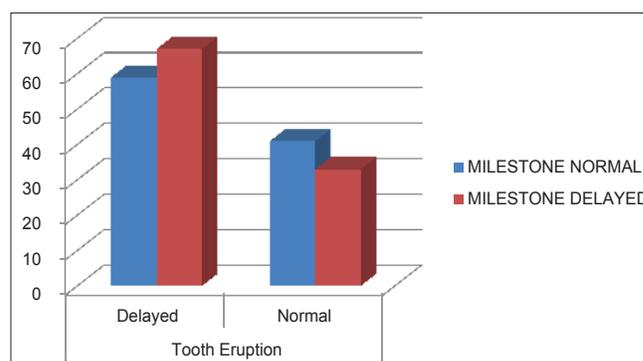
Table 2 and Graph 1 shows the comparison of the developmental milestones with the age appropriate teeth erupted in the child.

On statistical analysis, it was found that there was predominant delayed eruption in both the groups', i.e., children with normal as well as with delayed milestones. It was noticed that among normal milestones group, 40.7% children had age appropriate teeth present, whereas in delayed milestones group, 32.8% children had teeth present according to their age. i.e. if milestones were delayed age appropriate teeth were also delayed in children though the result was not statistically significant ($P = 0.03$).

It was observed that teeth eruption was delayed in children irrespective of the milestones whether it was delayed or normal.

DISCUSSION

Children grow at an amazingly fast rate during their 1st year of life. Other than the physical growth in height and weight, the major achievement stages that the children undergo during their life are referred to as the developmental milestones. These include simple skills such as rolling over, sitting up, and walking. These stages can be categorized as motor development, language development, and social/emotional development.⁸



Graph 1: The relationship of present teeth status in relationship to the developmental milestones

Table 1: Developmental milestones according to AAPD7

Hearing and understanding	Talking
<p>Birth-3 months</p> <ul style="list-style-type: none"> Startles to loud sounds Quiets or smiles when spoken to Seems to recognize your voice and quiets if crying Increases or decreases sucking behavior in response to sound <p>4-6 months</p> <ul style="list-style-type: none"> Moves eyes in direction of sounds Responds to changes in tone of your voice Notices toys that make sounds Pays attention to music <p>7 months-1 year</p> <ul style="list-style-type: none"> Enjoys games like peek-o-boo and pat-a-cake Turns and looks in direction of sounds Listens when spoken to Recognizes words for common items like "cup", "shoe", "book", or "juice" Begins to respond to requests (e.g. "come here" or "want more?") <p>One to two years</p> <ul style="list-style-type: none"> Points to a few body parts when asked Follows simple commands and understands simple questions ("Roll the ball", "kiss the baby", "where's your shoe?") Listens to simple stories, songs, and rhymes Points to pictures in a book when named <p>Two to three years</p> <ul style="list-style-type: none"> Understands differences in meaning ("go-stop", "in-on", "big-little", "up-down") Follows two requests ("Get the book and put it on the table") Listens to and enjoys hearing stories for longer periods of time <p>Three to four years</p> <ul style="list-style-type: none"> Hears you when call from another room Hears television or radio at the same loudness level as other family members Answers simple, "who?", "what?", "where?", and "why?" questions <p>Four to five years</p> <ul style="list-style-type: none"> Pays attention to a short story and answers simple questions about them Hears and understands most of what is said at home and in school 	<p>Birth-3 months</p> <ul style="list-style-type: none"> Makes pleasure sounds (cooing, gooing) Cries differently for different needs Smiles when sees you <p>4-6 months</p> <ul style="list-style-type: none"> Babbling sounds more speech-like with many different sounds, including <i>p</i>, <i>b</i>, and <i>m</i> Chuckles and giggles Vocalizes excitement and displeasure Makes gurgling sounds when left alone and when playing with you <p>7 Months-1 year</p> <ul style="list-style-type: none"> Babbling has both long and short groups of sounds such as "tata upup bibibibi" Uses speech or non-crying sounds to get and keep attention Uses gestures to communication (waving, holding arms to be picked up) Imitates different speech sounds Has one or two words (hi, dog, dada, mama) around first birthday, although sounds may not be clear <p>One to two years</p> <ul style="list-style-type: none"> Says more words every month Uses some one- or two- word questions ("where kitty?", "Go bye-bye?", "What's that?") Puts two words together ("more cookie", "no juice", "mommy book") Uses many different consonant sounds of the beginning of words <p>Two to three years</p> <ul style="list-style-type: none"> Has a word for almost everything Uses two- or three- words to talk about and ask for things Uses <i>k</i>, <i>g</i>, <i>f</i>, <i>t</i>, <i>d</i>, and <i>n</i> sounds Speech is understood by familiar listeners most of the time Often asks for or directs attention to objects by naming them <p>Three to four years</p> <ul style="list-style-type: none"> Talks about activities at school or at friends' homes People outside family usually understand child's speech Uses a lot of sentences that have 4 or more words Usually talks easily without repeating syllables or words <p>Four to five years</p> <ul style="list-style-type: none"> Uses sentences that give lots of details ("The biggest peach is mine") Tells stories that stick to topic Communicates easily with other children and adults Says most sounds correctly except a few like <i>l</i>, <i>s</i>, <i>r</i>, <i>v</i>, <i>z</i>, <i>ch</i>, <i>sh</i>, <i>th</i> Says rhyming words Names some letters and numbers Uses the same grammar as the rest of the family

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Table 2: Relationship between milestones and teeth status

Variable	Types	Teeth status (%)		P value
		Absent	Present	
Milestone	Normal	59.2	40.7	0.035
	Delayed	67.1	32.8	

Children tend to follow the same progression through these milestones; however, no two babies go through these milestones at exactly the same time. They also spend

different amounts of time at each stage before moving on to the next.⁸

There is a wide variation in the normal age range of developmental milestones which can be because of a variation in factors such as genetic, cognitive, physical, family, cultural, nutritional, educational, and environmental factors. Many children reach some or most of these milestones at different times from the norm.⁹

Just as the milestones mark the various stages of a child's physical and emotional development, the eruption

pattern marks the oral and dental development of a child with age.

We do not usually think of a newborn as having teeth. However, at birth the crowns of the 20 “baby” or primary teeth are almost formed, and are enclosed within the jawbones. The primary teeth gradually erupt through the gums during the first 2.5 years of life.¹⁰

This study, hence, aimed to evaluate if the developmental milestones and dental eruption patterns are interdependent.

From the results, we can conclude that children having appropriate timings of various developmental milestones had normal dental eruption patterns. However, even in case of delayed developmental milestones, the dental eruption pattern was not necessarily found to be delayed in all cases but was normal in some.

According to our knowledge, there is no previous literature showing comparison between the milestones and the eruption pattern of teeth.

As per the literature dental eruption and skeletal growth are strongly associated with each other.¹¹ Eruption of teeth is found to be positively related to somatic growth. The reason may be the breastfeeding as it has an important influence on thrust and growth of mandible.¹²

Although, a study was done by Folayan *et al.*¹³ in which he compared teeth eruption with feeding habits but failed to establish any link between eruption timing and duration of breastfeeding.

Though breastfeeding and teeth eruption were compared, and it may be related to somatic growth or developmental stages, we cannot say that tooth eruption is directly dependent upon developmental milestones.

CONCLUSION

We would like to conclude that no significant correlation exists between developmental milestones and tooth eruption. It is not necessary if a child has delayed milestones his teeth eruption will also be delayed. A person cannot decide the timing of tooth eruption on the basis of the developmental milestone of a child.

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