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The Influence of Feeding Pattern on the Occlusion of Permanent Teeth

A project

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Declaration

This is to certify that the organization and the preparation of this thesis had been made by graduate student **Riam Hatim Mohammed** under my supervision in the College of Dentistry, University of Baghdad in partial fulfillment of the requirement for the 5^{th} grade.

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Dedication

This project is dedicated to my parents.

For their endless love, support and encouragement.

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Abstract

Background: The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of life to achieve optimal growth, development and health. These recommendations are supported by a systematic review which states the benefits of breastfeeding for six months for minimizing the risk of gastrointestinal infection and growth deficits in young children.

Aims of the study: The aim of the present study was to show the effects of feeding pattern of children on the occlusion in their permanent dentition.

Materials and Method: A total sample of 48 school child (36 boys and 12 girls) of 6,7,8and 9 years, who collected from Baghdad University College Of Dentistry teaching hospital in the pedodontic and prevention department, the permanent teeth occlusion was assessed by Angle's occlusal classification and questionnaires were delivered to the children's parents regarding the history feeding practice.

Results: The results demonstrated that the mixed feeding pattern was the highest feeding pattern followed by breast feeding pattern and then bottle feeding pattern respectively and it showed that the highest occlusal classification was Cl I followed by Cl II and Cl III respectively. The results illustrated that Cl I percentage was the most common occlusal relationship among all feeding patterns groups and for total sample. The results also showed that Cl II percentage was the highest among mixed feeding pattern than the breast and bottle feeding pattern respectively.

While Cl III percentage showed highest percentage among bottle feeding pattern than mixed and breast feeding patterns respectively.

Conclusion: The study showed that there is no clear association between feeding pattern and malocclusion of premanent teeth.

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%	Percentage
No	Number
Cl	Class
yrs	years

Introduction

Introduction

Among health conditions such as infectious diseases and childhood mortality, malocclusion has been considered a type of disorder which could be prevented by breastfeeding. Malocclusion is not a single disease, but a group of developmental disorders arising from multiple causes. These occur in the craniofacial structure, composed of jaw, tongue and facial muscles and may cause deformity or lack of functionality, depending upon the extent of the disorder, malocclusion can impair quality of life (Petersen, 2003).

However, the findings of some studies have confirmed the association between feeding habits and the occurrence of malocclusion in the primary dentition. (Vázquez et al.,2006; peres et al.,2007). Indeed, both breastfeeding and bottle feeding have been associated with a greater chance of cross-bite development when preschool children are evaluated (Karjalainen et al.,1999; Viggiano et al., 2004).

There is general agreement that breastfeeding is good for the growth and health of infants. In less developed countries it may be the only way to provide complete nutrition for sustaining neonates' growth during the first 4-6 months of life, while at the same time reducing the incidence of infectious diseases such as diarrhoea and respiratory tract infections during the first year (WHO,1995; Slusser and Power, 1997).

Moreover, a recent systematic review had shown that the scientific evidence that breastfeeding could protect against malocclusion in the deciduous dentition could not be confirmed (Hermont, 2015). Nevertheless, the association between feeding habits history and malocclusion in mixed and permanent dentitions had been poorly discussed thus far (Narbutyte et al., 2013).

Aims of the study

The aim of the present study was to show the effects of feeding pattern of children on the occlusion in their permanent dentition.

Chapter one

Literature Review

1.1 Occlusion

The science of occlusion is that the occlusion of the teeth is any position in which the upper and lower teeth come together, and the articulation of the teeth is the functional movement of the lower dentition in contact with upper dentition (Foster, 1982).

Guidance of eruption and development of the primary, mixed and permanent dentition is an integral component of comprehensive oral health care for all pediatric dental patients, such guidance should contribute to development of permanent dentition that is stable, functional, and esthetically acceptable occlusion and normal subsequent dentofacial development. Early diagnosis and successful treatment of developing malocclusions can have both short-term and long-term benefits while achieving the goals of occlusal harmony and function and dentofacial esthetics (Kanellis, 2001; Kurol, 2002).

The ideal occlusion that described by Foster (1982) as theoretical concept based on the morphology of the teeth this is almost never found in nature, the value of ideal occlusion is a theoretical standard by which other occlusion can be judged (Curzon and Polland, 1997).

The term normal occlusion encompasses minor deviation from ideal, which do not constitute the esthetic or functional problems. It is not possible to specify precisely the limits of normal occlusion; there can be disagreement even between experienced clinicians about categorization of border lines cases (Houston and Tulley, 1986)

1.1.1 Etiology of malocclusion

To categorize etiological factors, several methods had been used. One classification is that malocclusion may be caused by hereditary, environment or a combination of the two (Graber and swain, 1985).

Another method of classifying etiologic factors is to divide them into two groups, the general group and the local group (Houston, 1986), general factors which include: skeletal malrelations, soft tissue factors, and discrepancies between tooth size and arch size resulting in crowding or spacing while the local factors include: anomalies in the number of teeth as supernumerary teeth, congenital missing teeth and retained deciduous teeth or anomalies in form and position of teeth, other local factors are habits as thumb sucking and also abnormal labial fraenum, local factors result in irregularities of few teeth.

1.2 Feeding pattern

1.2.1 Feeding:

Mother's milk is the best food for an infant providing all nutrition, stimulating maturation of the immune system, protecting from allergies, respiratory diseases, digestion disorders, exclusive breast feeding for at least six months had been highly recommended for preventing gastrointestinal infections and growth deficits in the first month of life (Neiva et al., 2003; Luz et al., 2006; Moher et al., 2009).

1.2.2 Feeding type:

Breast feeding: feeding the child exclusively breast milk for more than the first 3 months of his life, bottle feeding: feeding the child exclusively bottle milk from his birth or if bottle feeding started in the first three months of life and continued (Viggiano et al., 2004).

It is clear that breast feeding and bottle feeding involve different oro-facial muscles and some of them are more actively involved possibly leading to different effects on harmonic growth and development of dental arches, (weber et al., 1986; Nowak et al., 1994; Luz et al.,2006 ; Peres et al., 2007).

1.3 Factors effect on occlusions

The development of cranio-facial complex (jaws, dental arches, tongue, facial muscles) result from the interaction between genetic and environmental factors (Smith et al., 1988).

Scientific data claimed that early gained and long lasting harmful oral habits (e.g. finger sucking, mouth breathing) might negatively influence the development of bite (Luz et al., 2006: Peres et al., 2007; Montaldo et al., 2011).

1-habits:-

A-Non-nutritive sucking habits

Children with non-nutritive sucking showed significance differences from normal children like narrower maxillary arch width, greater overjet and greater prevalence of open bite and posterior crossbite, the prevalence of these abnormal deviations increase with time (Warren et al., 2001).

- **Digit sucking**

The sucking habit by itself is unlikely to produce an Angle's Cl II malocclusion nevertheless Cl II may be worsen by digit-sucking and this also interfere with the treatment (Meikle MC, 1970).

- **Pacifier**

Pacifier use might affect the developing cranio-facial structure, studies showed that pacifier use beyond 3 years has an increasingly harmful effect on the developing dentition like anterior openbite, posterior cross bite, narrow intercuspid width of the maxillary arch and a high narrow palate (Poyak, 2006)

B- Mouth breathing

Disorders of the craniofacial growth might obstruct the upper airway causing mouth breathing and this interfere with position of the teeth, this changes in the pattern of craniofacial

growth cause malocclusion which is represented by increasing overbite and overjet (Grippaudo et al., 2016).

C-Nails biting

Operational definition of nail biting is " putting one or more fingers in the mouth and biting on nail with teeth" (Teng et al., 2002).

Nail biting can damage teeth and alveolar structure, children with this habit should be referred for the assessment and management of possible damages (Ghanizadeh, 2011).

D-Tongue thrust

It usually affects the developing teeth to the extent of preventing the full vertical development of anterior dento-alveolar segment, so that an incomplete overbite or more usually an anterior open bite develope, the upper and lower incisors may be proclined by the action of tongue (Foster, 1982).

1.4 Malocclusion & feeding pattern

An attraction hypothesis is that early sucking activity influences the growth of cranio-facial complex (Palmer , 1988). Several reports suggested that non-nutritive sucking (usually in the form of dummies/pacifiers or thumb sucking) might be responsible for some forms of malocclusion of infancy (especially open bite and posterior cross-bite), but the role of early feeding on occlusion appears unclear based on published results and needs to be further evaluated (Tomit et al., 2000; Warren et al., 2001).

Artificial teats have a specific shape; furthermore they are made of more rigid material than breast tissue, such characteristics lead to non-physiologic pressure in the oral cavity which may restrict normal transverse growth of the palate and cause inappropriate alignment of teeth subsequently (Viggiano et al., 2004; Peres et al., 2007).

Breastfeeding promotes harmonious development of maxillofacial system stimulating intensive orofacial muscular activity (Carrascoza et al., 2006; Kobayashi et al., 2010; Vasconcelos et al., 2011).

Active sucking movements stimulate adequate lip closure and correct position of tongue at rest (Neiva et al., 2003; Carrascoza et al., 2006; Romero et al., 2011).

Therefore it has been suggested that longer breastfeeding duration may be related with fewer occlusal abnormalities and functional disorder (Peres et al., 2007; Moimaz et al., 2008)

Kobayashi et al.. (2010) showed that the breast feeding for more than 12 months had lower risk for the development of malocclusion compared with the children who was never breast feeding or with those who had breast feeding between 6 and 12 months.

Narbutyte et al.. (2013) showed that the positive impact of breastfeeding had been stated to prevent the development of dentoalveolar anomalies, especially posterior cross bite in addition, the longer period of breastfeeding decrease the risk of the non-nutritive sucking habits.

Antonio et al.. (2014) stated that breastfed infants show better development of the dental arches and a lesser incidence of dental occlusion disorders than bottle-fed infants.

While the study done by Guimaraes et al.. (2015) did not support an association between breastfeeding and bottle feeding and occurrence of malocclusion in mixed and permanent dentitions.

Peres et al.. (2015) showed that breastfeeding for more than 6 month decrease the risk of malocclusion.

Lucas et al. (2016) showed that children with mixed and permanent dentitions breastfed for more than 6 months presented greater mean protrusion of mandibular incisors and inclination of maxillary incisors compared with those breast-fed

for less than 6 months or those who were bottle-fed and revealed that breast feeding was associated with Cl II and Cl III malocclusion in children with permanent dentition.

Chapter Two

Materials And Methods

2.1 Sample

The sample of this study consisted of 48 child with (6-9) years of age (12 girls and 36 boys) collected from patients athhending college of dentistry teaching hospital/Baghdad university in preventive and pedodonticc departments, examination was done from 25\12\2017 to 5\3\2018.

2.2 Materials

1. Latex gloves
2. Masks
3. Disposable Dental mirrors

2.3 Assessment of feeding type:

After taking the permission from the parents to examine their children questionnaires were delivered to the parents regarding the history of feeding type (Appendix I).

2.4 Method of examination:

The children were examined in standard condition by seating the child on the chair in an upright position, by using dental mirror and good light, the assessment of the permanent first molars relationship was done carefully according to Angle classification (1899) (Figure 2-1), which are:

- Angle's Cl I occlusion the mesiobuccal cusps of the upper first molar occludes with the anterior buccal groove of the lower first permanent molars.

- Angle's Cl II the lower arch is at least on half cusp width distal to the upper judged by the first permanent molars and class II is divided according to the incisor relationship into.

- Division one in which the upper central incisors are proclined so that there is an increased overjet.
- Division two in which the upper central incisors are retroclined.

Characteristically the lateral incisors may be proclined and overbite is deep. The overjet may be average or increased by only a small amount.

- Angle's Cl III the lower arch is at least one half cusp width mesial to the upper judged by the first permanent molar relationship.

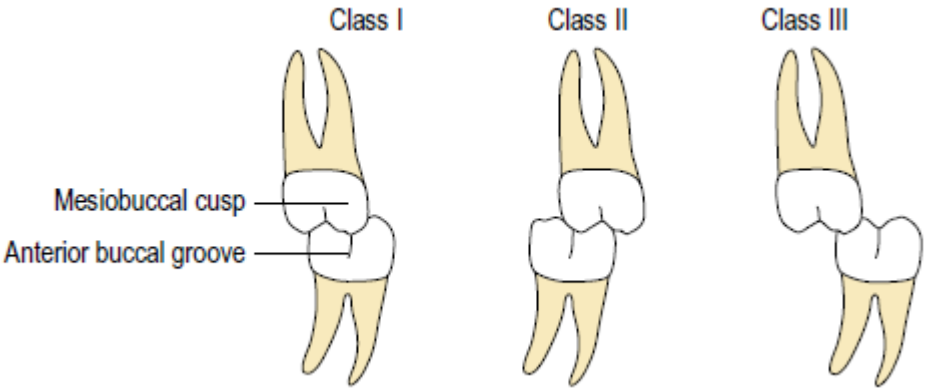

Figure 2-1 The Angle molar classification(Cobourne and DiBiase,2010).

2.5 Statistical Analysis

The statistical analysis was done using percentage.

Chapter Three

Results

3.1 The sample:

The sample distribution according to gender and age is illustrated in table (3-1).

The result showed that the boys were higher in percentage than girls and the highest age percentage was 6 years old followed by 8 years, 9 years and 7 years respectively for the total sample

Table (3-1) Sample distribution according to gender and age

Genders	**No**	**%**	**Age**	**No**	**%**
Girls	12	25%	**6 yrs**	16	33.33%
Boys	36	75%	**7 yrs**	8	16.67%
Total	48	100%	**8 yrs**	13	27.08%
			9 yrs	11	22.92%
			Total	48	100%

3.2 Feeding pattern:

Distribution of sample according to feeding pattern is showed in table (3-2).

The results demonstrated that the mixed feeding was the highest feeding pattern followed by breast feeding pattern and then bottle feeding pattern respectively.

Table (3-2) Distribution of samples according to feeding pattern

Feeding pattern	**No**	**%**
Breast feeding	18	37.5%
Bottle feeding	8	16.67%
Mixed	22	45.83%
Total	48	100%

3.3 The occlusion:

The distribution of sample according to occlusal Angle's classification is showed in table (3-3).

The results showed that the highest occlusion classification was Cl I followed by Cl II and Cl III respectively.

Table (3-3) Distribution of samples according to occlusal classification

Occlusion	**No**	**%**
Cl I	**30**	62.5%
Cl II	**12**	25%
Cl III	**6**	12.5%

3.4 Feeding pattern and occlusion:

The relation of feeding pattern and occlusal Angle's classification is demonstrated in table (3-4).

The result illustrated that Cl I percentage was the most common occlusal relationship among all feeding patterns groups and for total sample.

The results also showed that Cl II percentage was the highest among mixed feeding pattern than the breast and bottle feeding pattern respectively.

While in the Cl III group showed highest percentage among bottle feeding pattern than mixed and breast feeding patterns respectively.

Table (3-4) The relation between the feeding pattern and Angle's occlusal classification..

Feeding pattern	**Occlusion**					
	Cl I		**Cl II**		**Cl III**	
	No	**%**	**No**	**%**	**No**	**%**
Breast feeding	12	25%	5	10.42%	1	2.08%
Bottle feeding	4	8.33%	1	2.08%	3	6.25%
Mixed	14	29.17%	6	12.5%	2	4.17%
Total	30	62.5%	12	25%	6	12.5%

Chapter Four

Discussion

4.1 The sample:

This study was conducted to reveal the effect of the feeding pattern on the occlusion among primary school age children (6,7,8 and 9 years) in the Baghdad university college of dentistry hospital in pedodontic and prevention departments.

In this study the age was 6,7,8 and 9 years to observe if the feeding pattern effects on the occlusion of permanent dentition not only when they first erupt but also after few years after eruption.

4.2 The feeding pattern:

The result showed that the mixed feeding pattern was the highest percentage followed by breast feeding and bottle feeding pattern respectively this agrees with Charchut et al. (2003), which could be due the parents socioeconomic status and lifestyle which effect on the selection of the feeding type, because highly educated parents with high income prefer bottle feeding (Leite-Cavalcanti et al., 2007) and this result disagrees with kobayashi et al. (2010) this could be due to the sample size, study design and children age.

4.3 Angle's occlusion classification and feeding pattern types:

The result showed that Cl I percentage was the highest followed by Cl II percentage and Cl III percentage respectively and Cl I percentage was the highest in all feeding patterns this means that there is no clear association between feeding pattern and malocclusion, this results agree with Lucas et al.. (2016).

Cl I was the highest percentage in breast feeding than other feeding patterns this agrees with kobayashi et al. (2010) and vasconcelos et al. (2011) and disagrees with Lucas et al.. (2016), the agreement could be explained by the fact that the movement of lips and tongue during breastfeeding forces the child to draw breast milk through a squeeze action, while for children who are bottle-fed the movement for obtaining the

milk is more passive; therefore, there is greater potential to develop a class III with bottle feeding (Viggiano, 2004). In addition, the nipple of the infant feeding bottle is usually made from a less flexible material, which can press the interior of the oral cavity and may cause inappropriate alignment of teeth and the transverse growth of the palate (Drane,1996), which explains the highest Cl III percentage among bottle feeding which disagrees with the other study and it could be due to multiple reasons , considering gender, age, household income, education level, bruxism, digit sucking habit and mouth breathing pattern as confounding variables .

Chapter Five

Conclusions

5.1 Conclusion

1. The results showed that Cl I was the most common occlusal relationship among all feeding patterns groups and for total sample.
2. The results showed that Cl lll percentage was the highest in bottle feeding pattern followed by mixed and breastfeeding pattern respectively.

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Appendix

Appendix I

Case sheet No. ☐

اسم الطفل:

العمر:

الجنس:

Molar Angle's classification:

Cl I ☐

Cl II ☐

Cl III ☐

Feeding pattern:

Breast feeding ☐

Bottle feeding ☐

Mixed feeding ☐