

Effect of Breastfeeding on the Difference of Dentocraniofacial Growth among Children Aged 3-5 Years Old Malay and Batak Ethnic

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Abstract

Objective: The benefits of breastfeeding are numerous, such as ideal nutrition, intake of best enzymes and antibody as well as psychologically attachment to mothers. Breastfeeding is profitable but in promotion not reached to the essential health of dental and oral yet. It is profitable effect while a baby sucking that breastfed may stimulate the growing of the jaws up and strengthen orofacial muscles maximally.

Materials and Methods: A retrospective cohort on 3-5 years old, both breastfed and not among Malay and Batak ethnic are conducted to identify the average different of vertical cephalic index, maxillary canine arch depth and palatal depth.

Results: There are significant differences of all variables measured between the children in babyhood who were breastfed and no breastfed ($p < 0.05$). On the Batak ethnic, there is no significant difference of vertical cephalic index, maxillary canine arch width and posterior segment arch length ($p < 0.05$). The result indicated that children who were breastfed between Malay and Batak ethnic are differ in cephalic height, cephalic length, dental arch and palatal depth ($p < 0.05$), there was no significant differences in average of vertical cephalic index ($p > 0.05$). Children who were not breastfed between Malay and Batak ethnic, are significantly differ in cephalic height, cephalic length, vertical cephalic index, canine arch depth, molar arch depth, anterior segment arch length and posterior segment arch length ($p < 0.05$). There is no significant difference in maxillary canine arch width, maxillary molar arch width and palatal depth ($p > 0.05$).

Conclusion: Exclusive breastfeeding may stimulate the growth in dentocraniofacial which further influence the size of dental arch as the main factor to avoid malocclusion.

Keywords: exclusive breastfeeding, dentocraniofacial, growth and development, malocclusion.

I. Introduction

Breast milk contains all the nutrients that an infant needs which can not be substituted in other milk and product (Yuliarti, 2010). Breast milk may flow on smooth musculatures surrounding alveoli, then later into a larger channel to enter a storage under areola functioning as a temporary reception until the baby might suck it (Nirwana, 2014). Exclusive breastfeeding given might present positive effect on the growth of jaws, included a forming palatum durum. When the baby is sucks, the position of baby's lips sticks on areola breast where his tongue then absorbed with tongue-pull moved taken in palatum molle. His tongue then bring and send a pressure wave up to oropharing, and lower part jaw moved backward in helping process of swallowing (Kobayashi, 2010). Studies showed that the of head has a correlation with type of face, palatal or type of dental arches (Rahardjo, 2011). Koesnoto (1988), Koesoemahardja (1991) argued that group of Proto Malay has a smaller cephalic index compared to a group of Deutro Malay. Dentocraniofacial growth and development may involve the growth in occlusion, the dental arch as well as harmonious growth of the maxillae and mandibula which as well correlated with the growth of craniofacial (Hayati, 2003). In this study, dentocraniofacial growth and development that known by measure of vertical cephalic index, dental arch and palatal depth. Previous study had already explored the correlations between the time in shortly given breastfed with occurrence of oral habits resulted malocclusion. This study objective however to advantage of exclusive breastfeeding given from a view point of health in dental and oral, as an effort to have an early preventive on malocclusion.

II. Materials And Methods

The research was conducted on Province of Sumatera Utara at Desa Kedai Sianam, Kecamatan Lima Puluh, Kabupaten Batubara, knowing that majority population of Malay ethnic, and in Tarutung, Kabupaten Tapanuli Utara with majority of Batak ethnic. A total sample of 116 children of Malay ethnic and 95 Batak children were recruited. Inclusion criterias, 3 to 5 years old, teeth required in examining of the arches are seen

completed and caries with no any disorder hereditary and willingness as respondent to have examining in dental and teeth moulding. Cephalic height was measured using a digital caliper from point of nasion to gnathion. Cephalic length was measured using a digital caliper and in ruler from point glabella into inion. All measures was conducted three times by different one. The rate of vertical cephalic index using a formulation (Nakata, Wei, 1988):

$$\text{Vertical cephalic index} : \frac{\text{Cephalic height}}{\text{Cephalic length}} \times 100$$

Arch width in the maxillary arch was measured as intercanine arch width from cusp tip to cusp tip. Inter-molar arch width was measured between the mesiobuccal cusp tips on the right and left second primary molars. Arch depth was measured from midpoint between the central incisors to a line connecting the distal contact points of the right and left canines. Posterior arch depth was defined as the length of a line running perpendicularly from the midpoint between the central incisors to a line connecting the most distal points of the right and left second primary molars (Warren, Bishara, 2002). Anterior segment arch length was measured from the contact area of the central incisors to the contact area between the canine and the first primary molar. Posterior segment, from the contact between the canine and the first primary molar to the most distal point of the primary second molar (Moyers, 1988). Palatal depth was measured as the length of a line from the deepest points in the palate to a line connecting the mesiolingual cusp tips of the right and left second primary molars (Moyers, 1988).

III. Results

The average differences of vertical cephalic index, dental arch and palatal depth between children who was breastfed compare to who were not among Malay and Batak ethnics

The result indicate that there are average difference of all variables measured between children who was breastfeed compare to who were not among Malay ethnic ($p < 0.05$). On Batak ethnic, there is a significant average differences of cephalic height and cephalic length, maxillary canine arch width, maxillary molar arch width, molar arch depth, posterior segment between children who was given breastfed to children who no breastfed ($p < 0.05$) and there is a significant average differences of vertical cephalic index, canine arch depth and posterior segment arch length between children who was breastfeed compare to who were not among Batak ethnic ($p > 0.05$).

Table 1 The Average Differences of Vertical Cephalic Index, Dental arch and Palatal depth between Children who was Breastfed Compare to who were not among on Malay and Batak Ethnics

Variable	Malay Ethnic			Batak Ethnic		
	Breastfed	No Breastfed	P	Breastfed	No Breastfed	p
Cephalic Height	8.78	8.29	0.000	8.29	7.96	0.000
Cephalic Length	16.90	16.30	0.000	16.00	15.50	0.000
Vertical Cephalic Index	51.70	50.38	0.011	51.63	51.63	0.982
Maxillary Canine Arch Width	31.03	28.52	0.000	30.24	29.34	0.000
Maxillary Molar Arch Length	47.06	45.52	0.001	45.71	44.25	0.003
Canine Arch Depth	12.06	11.19	0.000	10.40	8.92	0.085
Molar Arch Depth	28.65	28.65	0.003	27.64	26.73	0.044
Anterior Segment Arch Length	33.56	33.56	0.000	38.14	34.34	0.005
Posterior Segment Arch Length	43.19	43.19	0.000	36.00	33.90	0.330
Palatal Depth	14.36	14.36	0.000	15.39	14.00	0.015

The average difference of vertical cephalic index, dental arch and palatal depth of children who were breastfed between Malay and Batak ethnic and children who were not breastfed between the two ethnics

The result indicates there are significant average difference in cephalic height, cephalic length, dental arch and palatal depth between breastfed children of Malay ethnic compare to the Batak Ethnic ($p < 0.05$). However there is no significant average difference of vertical cephalic index ($p > 0.05$).

The research indicates there are significant average difference in cephalic height, cephalic length, vertical cephalic index, canine arch depth, molar arch depth, anterior segment arch length, posterior segment arch length between breastfed children of Malay ethnic compare to the Batak Ethnic ($p < 0.05$). There is no significant average differences of maxillary canine arch width and maxillary molar arch width ($p > 0.05$).

Table 2 The Average Difference of Vertical Cephalic Index, Dental Arch and Palatal depth of Children who were Breastfed between Malay and Batak Ethnic and Children who were not Breastfed between the Two Ethnics

Variable	Breastfed			No Breastfed		
	Malay	Batak	P	Malay	Batak	p
Cephalic Height	8.78	8.29	0.000	8.29	7.96	0.000
Cephalic Length	16.90	16.00	0.000	16.30	15.50	0.000
Vertical Cephalic Index	51.70	51.63	0.530	50.38	51.63	0.038
Maxillary Canine Arch Width	31.03	30.24	0.015	28.52	29.34	0.507
Maxillary Molar Arch Length	47.06	45.71	0.001	45.52	44.25	0.308
Canine Arch Depth	12.06	10.40	0.000	11.19	8.92	0.000
Molar Arch Depth	28.65	27.64	0.001	28.65	26.73	0.010
Anterior Segment Arch Length	33.56	38.14	0.000	33.56	34.34	0.000
Posterior Segment Arch Length	43.19	36.00	0.000	43.19	33.90	0.00
Palatal Depth	14.36	15.39	0.000	14.36	14.00	0.165

IV. Discussion

The average differences of vertical cephalic index, dental arch and palatal depth between breastfeed children compare to those who were not among Malay and Batak ethnics

Result shows that all of measurements of Malay children are larger among those who were breastfed compare to those who were not. Breastfeeding during childhood may generate a positive influence on dentocraniofacial growth. According to Sum, et al. (2015), breastfeeding may stimulate the growth in three dimension direction they are sagital, transversal and vertical. The research by Ganesh, et al. (2005) pointed out there is a wide difference in maxillary canine arch width and maxillary molar arch width between breastfed children compare to those who were not. Aznar, et al. (2006) argued among unbreastfed children, the size with of maxillary molar arch width shall be smaller compared to those who were breastfed. The children of Batak ethnic, having a *dolichocephalic* oval shape, a quite narrow, long and depth, maxillary dental arch. By breastfeeding, the average rate of measurement on each dimension become larger except the vertical cephalic index.

The average difference of vertical cephalic index, dental arch and palatal depth of Children who were breastfeed between Malay and Batak ethnic and children who were not breastfed between the two ethnics

Result shows that exclusive breastfeeding influences the growth of dentocraniofacial. Thus it is necessary to give special attention to Batak ethnic which known to have a *dolichocephalic* type. Average index in vertical cephalic of the children belong Batak ethnic in babyhood was no breastfeed is larger compared to the children of Malay ethnic. In breastfed given seen average index of vertical cephalic of the children in Malay ethnic shall be higher compared to the children in Batak ethnic. In the references indicated that a breastfed given is to stimulate the growth of craniofacial in normal (Radzi, Yahya, 2005: Narbutyte et al, 2013, Agarwal, 2014).

The Malay is known with *brachycephalis* type, in which the face is larger, less protrusive, short but large crania fossa which then presentin a wide, short and narrow palatal and maxillary dental arch. The research by Tajik, et al. (2011), found correlation between form of head, type of facial and dental arch type. Someone with *brachycephalis* type have a short facial (*euryprosopic*) to form dental arch in a *square* formed. Rahardjo (2011), that bases to the result of measure obtained a maxillary canine arch width, maxillary molar arch width, canine arch depth, molar arch depth and posterior segment arch length those breastfed children of Malay ethnic have a larger size compared to Batak ethnic, whereas arches anterior segment arch length and palatal depth is larger compared to the children in babyhood was breastfed given to the Malay ethnic.

V. Conclusion

Breastfeeding proved to stimulate dentocraniofacial growth and development that may influence the size of dental arch and palatal depth which play important role in achieving a proper occlusion. There is a tendency of malocclusion happen among children of Batak ethnic knowing that they are with *dolichocephalic* type of head.

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