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(SHORT COMMUNICATION)

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Preterm birth and its effects on craniofacial and dentoalveolar growth

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Abstract

Premature or preterm birth is a condition that takes place either before the 37th week of gestation or when the weight of the neonate is lower than 2500 grams (Paulsson et al., 2004; Cortines and Costa, 2016). Several factors that are related to the mother or the fetus have been considered as potential causes for this condition, whereas there is a consensus that there are potential parameters that could lead to premature birth which still remain to be identified (Hohoff et al., 2005; Seow, 1997). Despite the fact that the incidence of neonatal mortality owing to premature birth has been significantly decreased in the recent years, there are yet some side-effects that could affect specific organ systems of the fetus (Paulsson et al., 2004; Hohoff et al., 2005). Moreover, there are reports of possible influence of preterm birth on the development of the cognitive and psychological background of the affected children (Anderson and Doyle, 2008).

Keywords: Preterm birth; Craniofacial growth; Dentoalveolar growth; Children

1. Introduction

Regarding the dentofacial structures, there are ambiguous findings in the literature concerning a potential influence of the development and growth of the latter from the preterm birth and/or the treatment protocols followed the care of the respective infants. On the one hand, there are reports of altered palatal morphology which could be manifested as narrowing of the posterior palatal, asymmetry and greater palatal depth (Cortines and Costa, 2016). Furthermore, a particular shape of the palate has been reported as well, referred as "palatal groove" (Enomoto et al., 2017; Zaidi et al., 2015). The latter could be identified as a narrow hollow near the midpalate with irregular depth (Cortines and Costa, 2016). The latter has been attributed to several factors such as impaired sucking and swallowing of the preterm infant resulting in less effective pressure from the tongue (Germa et al., 2012), applied pressure from the intubation tube (Seow, 1997), absence of the tongue from its appropriate position in the oral cavity (Ginoza et al., 1989) and obstruction of maxillary growth owing to the intrauterine growth restriction (Germa et al., 2012). However, there are also reports stating that the increased palatal depth in preterm infants owing to the intubation is rather small and transient (Procter et al., 2012). Similarly, no significant differences in the arch length and width were reported in adolescent boys with a history of preterm birth comparted to full term controls. Nevertheless, preterm 16-years-old girls were found to present decreased arch dimensions compared to matched full term girls (Rythén et al., 2013).

Furthermore, as far as the cranial morphology is concerned, there are reports of decreased craniofacial width in very low birth weight children (Morris and Burns, 1994). Moreover, occipital flattening was found to be more evident in preterm children, while early preterm children were reported to have a greater tendency to a dolichocephalic growth pattern that late preterm ones (Launonen et al., 2019). Additionally, in a survey assessing adolescent children with obstructive sleep apnea, the preterm ones were found to present a more dolichocephalic pattern compared to the full term infants who had a greater mandibular retrognathism (Lian et al., 2017).

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Furthermore, there seems to be a connection between premature birth and the morphology and structure of the teeth of the respective children. In detail, several authors indicate a significant correlation of premature birth with developmental defects of enamel and reduced dimensions of the teethboth in the deciduous (Aline et al., 2000; Bensi et al., 2020) as well as the permanent dentition (Ebrahim and Paulsson, 2017).

In addition to the previous, there is a controversy in the literature regarding the possible effects of preterm birth on the development of various traits of orthodontic malocclusion. For example, there are articlesreporting on a higher rate of posterior crossbite and open bite in preterm children (Germa et al., 2016; Objois and Gebeile-Chauty, 2019), whereas there are also data claimingthat the distribution of different types of orthodontic malocclusion during the primary dentition does not present significant differences between term and preterm infants (Primozic et al., 2014).

2. Conclusion

In conclusion, the connection between the premature birth and its sequelae and the craniofacial and dentoalveolar growth seems to be quite controversial. Hence, the need of properly designed trials incorporating recent technological advances so as to accurately assess the orofacial development and examining the correlation between the latter and specific mother- and embryo-relatedfactors is mandatory.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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