

Timing of dental development in Saudi cleft lip and palate patients

To the Editor

Bindayel et al¹ addressed in their interesting study comparing with their chronological age, Saudi patients with non-syndromic cleft lip and palate (CLP) have delayed dental development as defined by dental age using Demirjian's method. Actually, a lot of concerns do present worldwide, considering the accuracy of Demirjian's method in assessing the timing of dental development. A recent meta-analysis was conducted on 26 studies with a total of 11,499 children (5,301 boys and 6,198 girls) aged 3.5 to 16.9 years. Overall, the Demirjian's method was found to overestimate dental age by 0.35 years in males (4.2 months), and 0.39 years in females (4.68 months). A subgroup analysis by age revealed that boys and girls between the ages of 5-14 years were given a dental age estimate that was significantly more advanced than their chronological age. Differences between the underestimated dental ages and actual chronological ages were lower for male and female 15- and 16-year-old subgroups, although a significant difference was found in the 16-year-old subgroup. Accordingly, Demirjian's method's overestimation of actual chronological tooth age has triggered the need for population-specific standards to better estimate the rate of human dental maturation.²

In the Kingdom of Saudi Arabia, considerable concerns between the true and estimated dental age based on the Demirjian's curves have been also triggered. This is based on the following 2 points: 1. comparing the accuracy of dental age of different population-specific curves, using the Demirjian method, to the chronological age of Saudi children aged between 4 and 14 years, has suggested that although population-specific curves are more accurate in the prediction of age, a considerable variation within each population still exists. The Demirjian's method offers a great scope in fields that require the study of the pattern of growth rather than the accuracy of age estimation;³ and 2. the role of ethnicity-specific dental maturation curves in dental age estimation of Saudi children has been recently assessed among a cohort of healthy Saudi children aged 4-14 years based on the original French-Canadian Demirjian's curves, and several modified Demirjian curves specified for certain ethnic groups: Saudi, Kuwaiti, Polish, Dutch, Pakistani, and Belgian. The curves designed for Dutch, Polish,

Saudi, and Belgian (5th percentile) populations had a significantly lower error in estimating age than the original French-Canadian and Belgian (50th percentile) curves. The optimal curve for males was the Saudi one, with a mean absolute difference between estimated age and chronological age of 8.6 months. For females, the optimal curve was the Polish one, with a mean absolute difference of 7.4 months. The study concluded that ethnicity might play a role in age determination, but not a principal one.⁴ Recently, new age prediction models and maturation scores for Saudi population are developed based on the Demirjian's method using multinomial functions. They have a significantly lower error than the tables designed for French-Canadian and Belgian populations.⁵ I presume that employment of these new maturation scores and tables designed specifically for Saudi population might alter 8.4 months delay in dental development for CLP patients reported by Bindayel et al.¹

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Reply from the Author

In reference to the letter to the editor concerning our recent publication,¹ the authors would like to thank the correspondent author for his kind interest and constructive input.

The letter has nicely re-stated the limitations of using Demirjian's method⁶ for dental age assessment, and discussed its potential variations with different ethnicities, along with dental age over estimation tendency for non-CLP subjects^{7,8} that was emphasized similarly within our published paper. While we generally agree with the correspondent author's recommendation of utilizing the new maturation scores and tables designed for Saudi population, the fact that doing so would potentially alter the 8.4 months delay we recently reported in dental development for CLP patients, we have considered the following: 1. The investigation was designed as a pilot study to primarily assess the timing of dental development in Saudi CLP. Demirjian's method was used as a validated⁹ and reliable¹⁰ tool to essentially detect any delayment/advancement pattern, regardless of its magnitude. This is carried out to justify the conduction of further research with appropriate study design to quantify such developmental discrepancies; 2. knowing the currently stated findings, a more specific

study design should be followed to accurately assess the magnitude of the reported delayment. Rather than using adjusted Dermerjian's scores for Saudi population, incorporating a control group should render a more accurate reporting that is independent of experiencing subgroups' ethnicities shortcoming that was referred to earlier.³ The subsequent study design would include increasing the sample size, extending the currently described comparison design to capture CLP patients and control subject groups, and finally, conduct a comparison between each of the 2 groups' mean differences. This should result in a more validated findings where Dermerjian's method is utilized conservatively as a calibrated reference tool rather than an actual measuring method, thus, limiting its shortcomings reported in the literature; and 3. finally, the adjusted tables published for Saudi population was not validated for CLP affected groups, which limits its potential application to control groups.

Once again, we value the appreciated communication that encourages the utilization of Saudi adjusted Dermerjian's scores whenever applicable.

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