Evaluation of facial pattern in Black Brazilian subjects

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Abstract
Black subjects present craniofacial characteristics that differ from other ethnic groups. Thus, there is a need for studies that allow proper diagnostics for this specific group. This study aimed to evaluate the facial pattern in young Black Brazilian subjects by FMA and “Y”-axis cephalometric measurements. The sample comprised the lateral cephalograms of 37 Black untreated young Brazilian subjects of both genders (16 males and 21 females), aged from 10 to 14 years, all from Piracicaba, São Paulo, Brazil and surroundings; their occlusion was excellent by clinical standards, and they have never undergone orthodontic treatment. Following statistical analysis of data, it was observed no significant difference in facial pattern ratios between genders (Fisher’s exact test; p = 0.1596), but the prevailing facial pattern was mesofacial, followed by dolicofacial. Brachifacial pattern was absent in this sample. The mesofacial pattern was prevalent among females, and both mesofacial and dolicofacial patterns were equally distributed among males.

Key words:
cephalometrics, Orthodontics, African continental ancestry group, facial pattern

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Introduction
The identification of a facial skeletal pattern is an extremely important factor for orthodontic diagnosis, as well as for individualization of many measures for the different ethnic groups.

Tweed triangle is a handy tool for orthodontics diagnosis, classification, treatment planning, and prognosis. Tweed\textsuperscript{1,2} associated the slope of lower incisors to Frankfurt horizontal plane. If FMA is 30° or higher, FMIA must be 65°, showing a prevalent vertical growth; if FMA is 25° ± 4°, FMIA must be 68°, thus showing a balanced facial growth; if FMA is lower than 20°, IMPA must not be higher than 94° and facial growth is mainly in horizontal direction\textsuperscript{1,2}.

Downs\textsuperscript{3}, trying to identify patterns of facial growth, established the “Y”-axis for growth, determined as the intersection of Frankfurt plane and the S-Gn line. The mean value was established as 59°, and when at higher values, it shows that horizontal growth is more intense than vertical growth.

Black subjects present craniofacial characteristics that are distinct from other ethnic groups, especially from Whites, who usually are the standards for routine cephalometric diagnosis and treatment planning in Orthodontics. Such proceedings evidence the concern on elaborating a more specific diagnosis and treatment planning to young Brazilian Black subjects.

The variety of craniofacial characteristics present in the different racial and ethnic groups was assessed in many studies\textsuperscript{4-17}, which mention the adoption of standard normality mean values for each specific group. So, each group should be evaluated separately, according to individual characteristics.

The aim of this study was to evaluate the facial pattern of Brazilian Black youngsters with clinically excellent occlusion in both genders.

Material and methods
Thirty seven lateral telerradiographs and dental casts of Brazilian subjects (16 males and 21 females), who had Black ancestry and aged from 10 to 14 years, were selected from the files of the Documentation Section of the Postgraduation Program in Orthodontics, Piracicaba Dental School, UNICAMP, Piracicaba, SP, Brazil, used. The Brazilian Black subjects had their origin mainly from Africa Coast, where Bantu population is prevalent. They have never undergone orthodontic treatment before and presented excellent occlusion, with face balanced, Class I molar and canine relationships and ANB ranging from 1 to 3°. The materials for the research were used in accordance to the standards of the Health Ministry under the resolution number 196/96 of National Health Council and the study was approved by the Ethics Committee in Human Research of the Piracicaba Dental School, UNICAMP, under the protocol number 127/2001.

The lateral cephalograms were separated according to gender. Only one researcher traced all the cephalograms over a negatoscope in a darkened room. Cephalometric tracings were performed on standard acetate paper (17.5 x 17.5 cm and 0.07 mm thickness) with a 0.3 mm graphite mechanical pencil, transparent ruler to the nearest 0.5 mm, protractor to the nearest 0.1°, template, adhesive tape and illuminator. Cranial and facial anatomical references were outlined, and Frankfurt and mandibular planes were drawn, thus originating FMA and Downs\textsuperscript{4} “Y”-axis (Figure 1). Tracings were performed twice, with a minimum interval of 10 days, according to the method described by Midtgard et al.\textsuperscript{18}.

The facial pattern was classified as mesofacial, dolicofacial and brachiofacial biotypes\textsuperscript{2,3}.

The Fisher’s exact test was applied to verify differences in facial pattern ratios between genders, at 5% level.
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Discussion

The advent of cephalometric radiographs enabled to study the craniofacial architecture as a whole. Since then, many studies and researches have been performed around the subject of cephalometrics, and thus have originated many cephalometric analyses that have assisted orthodontic diagnosis and treatment planning. However, one must remember that most of these cephalometric values were standardized from North American subjects. Different facial features are found among populations in general. Black Brazilian subjects have a bimaxillary protrusion, considered inherent and esthetically acceptable characteristics of this ethnic group. The estimation of human growth is quite a clinical challenge, since there are no predetermined parameters. Maturity is influenced by genetic, racial, nutritional, socio-economic factors, as well as by evolutionary changes of human specie. Three facial biotypes, that is, brachifacial, mesofacial and dolicofacial can be distinguished. A higher anterior facial height against a smaller posterior height, and predominant vertical against horizontal components are characteristic of dolicocephalic subjects, while such signs are opposite for mesocephalic subjects. Mesocephalic biotype presents intermediate characteristics when compared to the other types, showing a balance between vertical and horizontal components. In this sample, mesofacial pattern prevailed (74%) in females (Figure 2), suggesting balanced growth. In males, mesofacial (47%) and dolicofacial (53%) were slightly balanced (Figure 3), thus suggesting balanced and vertical growth patterns, respectively. Statistical results showed no differences between genders, though mesofacial pattern prevailed among females, and there was an even distribution for mesofacial and dolicofacial patterns among males. Such findings may be due to the small sample size, and also because of an uneven gender distribution in the sample. The typical broader face in brachifacial individuals, adding the smaller nose, square-shaped cheeks and vertical forehead, tend to emphasize female dimorphic characteristics, this pattern was not found in our sample. Dolicofacial pattern was present in females and, in larger numbers, in males. Such biotype is related to a narrow, manly face, though, naturally, such are not exclusively male characteristics.

Due to the sample size, our findings cannot be applied on Brazilian population in general. Additionally, the characteristics of Brazilian population can be factors of influence. Further studies in this field are necessary, looking for selecting a reliable sample, defining the ethnic group, and considering the regional differences.

Concluding, in this studied sample the prevailing facial pattern was mesofacial, followed by dolicofacial; brachifacial pattern was absent in this sample and some difference could be observed while comparing percentile values, as a prevalence of mesofacial pattern in females, and similar number for mesofacial and dolicofacial patterns in males.

References