

DYNAMICS OF FACIAL PROPORTIONS DURING ADOLESCENCE AND COMPARISON OF FACIAL INDICES CALCULATED USING DIRECT ANTHROPOMETRY AND PHOTOGRAPHS

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Background: Adolescence is a period of rapid facial growth. Facial proportions change significantly during puberty. Studies investigating facial proportions during adolescence are scarce. One method of analysis is the calculation of facial indices. Faces can be analysed using different methods. Studies comparing different approaches for facial analysis are controversial.

Objective: The aim of this study was to assess the dynamics of facial proportions during adolescence and compare indicators calculated using direct anthropometry and photographs.

Subjects and methods: Study included 1376 adolescents from 10 to 20 years of age. Their faces were measured directly and photographed in frontal plane. Craniofacial landmarks were obtained, facial parameters were measured, 34 facial indices were calculated. Their dynamics were analysed using direct anthropometry method.

Results: The facial index gradually increased in both sexes, while the interpupillary distance relative to facial height decreased ($p < 0.05$). The zygomandibular index and the nasal width relative to facial height remained stable in both sexes ($p > 0.05$). The indices in girls did not change as rapidly as those in boys. The indices involving eye parameters and morphological facial height, and those involving eye parameters and bigonial width, were higher in girls ($p < 0.05$). The ratio of eye parameters relative to morphological facial height and labial fissure width did not differ between the two methods ($p > 0.05$). All indices involving bizygomatic width differed between the two methods ($p < 0.05$).

Conclusions: The faces have become relatively longer than wider. Cheeks and jaw grew horizontally evenly. Nose grew vertically at a similar rate faces got longer in both sexes. Boys' faces were relatively longer and their jaws were wider. Indices, that agreed with the two methods, mostly included vertical parameters, eye dimensions, and labial fissure width. Indices involving cheeks width showed the least agreement between the two methods.

Keywords: Anthropometry; Facial indices; Facial photographs.