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Sella turcica dimensions between 7 and 13 years: a novel radiographic method for age estimation

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Age estimation of the living is becoming a relevant field of application of forensic anthropology, where the development of novel methods is urging (1). Several articles highlight the relation with age of different metrical parameters of the sella turcica (2,3), although no study so far has produced regression formulae which may be applicable to the forensic context. The aim of this study was to evaluate the metrical standards of three different measurements of sella turcica (length, depth, diameter) in 177 lateral cephalometric radiograms belonging to male and female individuals aged between 7 and 13 years in order to find standards useful for age estimation. Results were evaluated by two-way ANOVA. Sella diameter was significantly larger in older children ($p<0.01$), while sella depth was larger in males than in females ($p<0.01$); there was no significant gender x age interaction in any variable. Principal component analysis (PCA) was conducted to highlight the sources of variability in data. The first principal component accounted for 76% of the overall variance and it was closely correlated with length and diameter ($r=0.93$ and $r=0.92$, respectively, $p<0.01$). The linear regression model fitted on age and diameter measures yielded the following equation: age (years)=3.81*diameter (cm)+6.12. Slope and intercept 95% CI were respectively 4.64 to 7.61 years/cm and 2.34 to 5.28 years. The related coefficient of determination was $R^2=0.123$, while the root mean square error was 1.74 years. The present results provide a novel method useful for age estimation in the living minors: further studies are needed in order to test its applicability to the forensic scenario.

References

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Keywords

Anatomy; age estimation; subadults; sella turcica; X-ray examination.