A26 Skeletal Age Estimation From Pubic Symphysis: A Systematic Review of the Suchey-Brooks Method

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Learning Overview: The goal of this presentation is to elucidate the accuracy and reliability of the Suchey-Brooks method, employed for pubic symphyseal age estimation, via the analysis of Computed Tomography (CT) scans of living individuals as well as skeletal remains.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by bringing to the forefront the use of radiographic modalities in age investigation studies as an alternative to the time-consuming and potentially destructive process of maceration.

Forensic age estimation is a multifaceted investigation tool, with applications in cases dealing with deceased as well as living individuals and also incorporating civil as well as criminal investigations.[1-3] Disparaging the bygone assumption that age estimation based on morphological changes occurring in the bones of an individual can only be analyzed postmortem, the inception of radiographic techniques such as CT has rendered scrutiny of said changes in living individuals possible. CT helps overcome the destructive and time-consuming process of maceration and helps in the analysis of these age-related morphological changes occurring throughout the skeletal framework. Over the past century, a myriad of methods have been devised for age estimation from skeletal remains. One such method, proposed by Suchey and Brooks in 1990, grouped the observed changes occurring within the pubic symphysis into six distinct phases, each defined by a corresponding age range.[4] The present study was piloted to determine the accuracy of the Suchey-Brooks method in computed tomographic age estimation by analyzing morphological changes occurring in the pubic symphysis of skeletal remains as well as living individuals. Original articles pertaining to the use of the Suchey-Brooks method for CT-based age estimation were extracted from four different databases—PubMed®, Cochrane Central Register of Controlled Trials (CENTRAL), Google® Scholar, and ScienceDirect®—using an adequately operative search strategy. Research papers that appeared to answer the focused question were further selected for data analysis. After assessing the risk of bias of the relevant observational studies, the data retrieved were subjected to meta-analysis.[5] Pooled, phase-wise, and subgroup analysis was performed to establish and verify the obtained results indicative of accuracy of the aforementioned method. Pooled analysis of correctly/accurately aged individuals/remains using the random and fixed effect models yielded a prediction percentage of 78% and 86%, respectively. Higher percentages of 92% and 82% were obtained with the fixed and random effect models respectively, for phase-wise analysis. Prediction percentages with subgroup analysis conclusively showed that morphological changes associated with Phases I, IV, V, and VI act as excellent indicators of age, whereas Phases II and III yield a comparatively lower accuracy. Results of meta-analysis indicate that the Suchey-Brooks method is a reliable method for age estimation studies. This systematic review aids in ascertaining the applicability of the Suchey-Brooks method via a thorough analysis of data related to accuracy from studies carried out across different populations. Additionally, it also verifies the fact that CT examination of the same furnishes satisfactory results, thus advocating its relevance in investigations pertaining to the field of forensic anthropology.

Reference(s):

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Age Estimation, Computed Tomography, Suchey-Brooks

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