

Limitation and delimitation of Cameriere's method of age estimation in Indian Population

Shilpa Dutta Malik¹, Mukesh Kumar², Manish Goyal³, Upender Malik⁴, Mohammad Zanol Abedeen⁵

Associate Professor¹, Professor^{2,4}, Professor and HOD³, Assistant Professor⁵

Department of Oral Pathology & Microbiology^{1,5}, Department of Orthodontics and Dentofacial

Orthopedics^{2,3}, Department of Oral Medicine and Radiology⁴, Teerthanker Mahaveer Dental College and

Research Centre, Delhi Road, Moradabad UP

Abstract:

The age estimation is of utmost significance in cases of law and legal matters. The actual age must be known, in case of child adoption, marriageable age and other legal issues like deciding punishment (juvenile or adult) and in case of treatment planning the actual age of patient must be known specially in cases of orthodontic treatment. The prime objective of this literature review is to highlight the limitation and delimitation of Cameriere's method of age estimation in Indian Population. Material & methods The database searched was PubMed, web of science and Scopus and the terms used were "Age Estimation", "Cameriere's" formula, "Indian population". Original articles about age estimation using Cameriere's method on Indian population written in English between 2006 and January 2023 were selected.

Keywords: Age Estimation, Cameriere's formula, Indian population.

INTRODUCTION

Age assessment in living and non-living individual is extremely important both according to clinical and forensic perspective, moreover in Indian court of law there are different punishments for juvenile and adults. Less than 18 years is considered as minor and the marriageable age for female is 18 years and 21 years for males.

As per Indian adoption law child age should be between 1 and 12 years of age. One of the few indicators of physiologic development that is consistently applicable from early childhood to late

adolescence is dental age. The analysis of the morphological characteristics of children's dental radiographs provides a more accurate age estimation than other techniques. The most popular method for age estimation in children is by radiograph of teeth and hand/wrist ⁽¹⁾ Demirijan method is most common method for age estimation which was published in 1973, but it has its own limitations Like over estimation of age ⁽²⁾ Several writers have created alternate ways based on the measurement of several important tooth properties, like the level of aspartic acid racemization in tooth enamel, to improve the method. ^(3, 4, 5) Radiographs of teeth show the length, width, and height of the pulp, roots, and crowns. Cameriere published a new technique that involved measuring the open apices of the left mandibular permanent teeth ⁽⁶⁾.

METHODOLOGY

Literature search was done using specific terms like Age Estimation, Cameriere's formula, Indian population in different combination using PubMed,

Correspondence address: Dr. Shilpa Dutta Malik, Department of Oral Pathology & Microbiology, Teerthanker Mahaveer Dental College and Research Centre, Moradabad, Uttar Pradesh, India.

Email: shilpa.dental@tmu.ac.in

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Scopus and web of science search engine. Up until January 2023, only research that had been done on the Indian population and published in English within the previous five years were included. Studies were considered if they satisfied the following requirements: Studies using radiographs to estimate age; original research studies (cross-sectional or non-cross-sectional in design); and full-text papers only (abstracts or conference proceedings without a full report were excluded). Participants in studies (subjects older than 5 years old were not included in these studies); • English was used for publication. The 10 chosen studies' key information was independently retrieved and entered into a Microsoft Excel sheet. The information that was extracted included the first author's name, the year the results were published, the study's location, the population it examined, the methods used to estimate the population's age, the sample sizes, the age-related techniques used, the population's age (mean and standard deviation), and the regression equation, if one had been found for the population under study. The specific keywords were selected so that no related study would be missed out.

RESULTS

In the initial search, 1241 (Age Estimation) potentially reliable results were found. We had 489 full text publications dealing with various age estimation approaches from the previous years after applying filters. Additional filtering that only included oral structures produced 180 full-text publications. The suitability of these articles for the current investigation was evaluated. 159 full text publications regarding the estimation of age using Cameriere's approach on an Indian population were found as a result of this screening. Only 15 of these research focused on the Indian people. The studies were carried out between 2007 and 2022.

The Journal of Forensic Dental Sciences published the most articles on age estimation (10), followed by the Journal of Forensic Odonto- Stomatology (5), and then other journals like the Journal of the International Society of Preventive & Community Dentistry, Forensic Science International, and the International Journal of Legal Medicine, to name a few. The majority of forensic dentistry studies have been published in South Indian states like Karnataka, Tamil Nadu, Telangana, and Andhra Pradesh. Mumbai, Maharashtra, follows these

studies. A few studies have also been reported from Ahmedabad, Bhubaneswar, and Meerut.

DISCUSSION

In recent decades, forensic dentistry has attracted a lot of interest, among all the techniques used in forensic odontology the age estimation technique is gaining popularity as it is of utmost significance in estimating age of children who belongs to rural area where exact date of birth is not known, moreover it is required for certain clinical procedures like orthodontic treatments where exact age must be known before conducting the procedures. Several authors⁽⁷⁻²¹⁾ conducted studies using Cameriere's method of age estimation in Indian Population and concluded that that males' estimated ages were underestimated and girls' estimates were overestimated when compared to their chronological ages.

CONCLUSION

Among various age estimation technique radiographic method using eruption of teeth is widely used.

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