G10 The Uniqueness of Human Teeth: A Systematic Review and Meta-Analysis

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Learning Overview: After attending this presentation, attendees will be informed about current literature status regarding the proof of uniqueness of the human dentition in the forensic context. This will be outlined in a systematic review and meta-analyses of publications considering the uniqueness of human teeth and dentitions.

Impact on the Forensic Science Community: There is still a lack of proof regarding the uniqueness of human teeth, despite diverse research attempts. A systematic review will reveal that a small number of related studies have been conducted, mainly allied to bitemark analysis. This presentation will impact the forensic science community by demonstrating the need for future research on uniqueness of human teeth, in particular as it relates to human dental identification.

Background: Attempts to prove uniqueness of human teeth in a forensic context have been undertaken. Related research addressed two different forensic areas: human dental identification and human bitemark analysis. A systematic review will identify and synthesize papers considering uniqueness of human teeth and dentitions.

Goal: To perform a systematic literature review in order to evaluate the proof of uniqueness of human teeth and dentition morphology in a forensic context.

Research Question*:* Was uniqueness of human teeth and dentition morphology proven in a forensic context?

Search Methods: An electronic search was performed in six databases: MEDLINE/PubMed®, Cochrane, EMBASE®, SciELO, LILACS, and Web of Science. Additionally, reference lists of included articles and study registers were searched. There were no restrictions related to country of publication, language, or publication date.

The systematic review complied with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement.[1,2] The review protocol was developed according to the Cochrane Guidelines for review protocols, and was registered in Prospero, the international prospective register of systematic reviews.[3,4]

Selection Criteria: To avoid bias, two reviewers independently selected articles based on titles and abstracts. Study populations, including living/deceased subjects, were considered. Review articles and pilot studies of included main studies were excluded. To check eligibility, both reviewers evaluated the full text papers independently. In case of disagreement, a consensus decision was made.

Data Extraction and Analysis: Data extraction and study characteristic tables have been developed. A tool for the risk of bias and paper quality assessment was developed, based on the Effective Practice and Organization of Care (EPOC) overview and Quality Assessment of Diagnostic Accuracy Studies (QUADAS)-2.[5,6] If data were unclear, not reported, or in a format unsuitable for the systematic review analysis, authors were contacted for further details. The articles were divided into two groups according to the area of investigation: human identification and bitemark analysis. Both groups were assessed based on the studied parameters (sample size, considered tooth/tooth part/tooth groups, registration technique for data collection, methods for data analysis, and study outcomes), and a comparison was conducted in each group and between groups.

Results: It was hypothesized that according to the electronic search, a small number of eligible published papers investigating uniqueness of human teeth in forensic context (approximate n=20) will be detected. A low quality of diagnostic accuracy in these studies is expected and the extracted data comparisons will highlight that the uniqueness of human teeth in forensic context was not scientifically proven. The results will be used to address the research question.

Reference(s):

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4. http://www.crd.york.ac.uk/PROSPERO.
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