

Forensic DNA medical expertise: Impacts on human identification

Sofia Ferreira Pena Quadros¹, Paula Viana Ferreira Moura², Matheus Álvaro Colbert Câmara³.

ABSTRACT

The systematic review analyzed the advancement of medical forensics in forensic DNA, highlighting its importance in identifying victims and solving crimes. The research, based on articles from PubMed, revealed that the integration of forensic anthropology and the use of genetic databases have improved accuracy and identification capacity. Despite the advances, challenges such as the interpretation of DNA mixtures and ethical issues still need to be addressed to maximize the effectiveness of these techniques.

Keywords: DNA, Human identification, Forensic medicine.

INTRODUCTION

The use of forensic DNA in human identification has revolutionized medical forensics, becoming a fundamental tool in solving crimes and identifying unknown victims. This systematic review aims to analyze the current state of medical forensics in forensic DNA.

MATERIALS AND METHODS

The systematic review was carried out through a search for articles in the PubMed database, using terms such as "forensic DNA", "human identification", and "medical expertise", in which 3 articles were selected to compose this study.

RESULTS

Systematic analysis has revealed advances in the field of forensic DNA medical expertise. In this context, areas such as forensic anthropology have significant contributions to the process of identifying victims of calamity, providing advanced technologies for forensic medicine¹. Advanced research also demonstrates how anatomical structures are considered valuable tools for studies to identify individuals in legal investigations through DNA analysis, being relevant in the context of forensics and genetic identification². As a result, the use of genetic databases has strengthened the ability to recognize individuals.

¹ Medical Doctor, University Center of Belo Horizonte, UNIBH – MG

² Medical Student, University of Itaúna, UIT – MG

³ Physician from the University Center of Belo Horizonte, UNIBH – MG



FINAL CONSIDERATIONS

The systematic review addresses how medical expertise plays a key role in the application of advanced forensic DNA techniques for human identification. In this context, the development of genetic analysis has revolutionized the ability to solve court cases, especially those involving unidentified victims, natural disasters, or violent crimes. Within the analysis of the researches, technical and methodological aspects involved in the innovation of the exploration of genetic markers stand out, such as the study of sequences present in the Y chromosome, favoring forensic investigations³. However, challenges remain, including the interpretation of DNA mixtures, the contamination of samples, and ethical issues related to privacy and consent. The evolution of medical expertise in forensic DNA highlights its importance in human identification. Technological advances have improved the sensitivity and specificity of tests, contributing to more reliable results in criminal and victim identification contexts. However, the review highlights that to maximize the potential of medical expertise in DNA, it is crucial to address persistent challenges, invest in ongoing research, and ensure integrity and ethics throughout the process.



REFERENCES

- De Boer, H. H., Blau, S., Delabarde, T., & Hackman, L. (2018). The role of forensic anthropology in disaster victim identification (DVI): Recent developments and future prospects. *Forensic Science Research*, 4(4), 303-315. <https://doi.org/10.1080/20961790.2018.1480460>. Accessed on October 2, 2018. PMID: 32002489; PMCID: PMC6968550.
- Ioganson, E. V., Agliullina, F. A., & Kravtsova, O. A. (2020). Sudebno-meditsinskoe znachenie zuba II sheinogo pozvonka kak iskhodnogo ob"ekta dlya identifikatsionnykh DNK-issledovaniy [Forensic value of the odontoid process of the second cervical vertebra as the initial object for DNA identification]. *Sud Med Ekspert*, 63(2), 29-31. <https://doi.org/10.17116/sudmed20206302129>. Accessed on March 31, 2020. PMID: 32297496. (In Russian).
- Liu, J., Xu, J., Wei, Y., & Zhang, H. (2020). The construction and application of a new 17-plex Y-STR system using universal fluorescent PCR. *International Journal of Legal Medicine*, 134(6), 2015-2027. <https://doi.org/10.1007/s00414-020-02291-3>. Epub April 22, 2020. PMID: 32322984.