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Rates of Sex Estimation by Forensic Anthropologists through Comparison with DNA

# An accurate sex valuation of unknown human skeletal is essential for the creation of a biological profile of the skeletal. However, current forensic anthropologists are using different techniques to assess gender. There are specific observational and other metric techniques that are used. Most of the methods are based on analysis of the collection of the skeleton of the body, and it will contain a research-based accurateness rate. Likewise, the selected article deals with sex estimation techniques to identify the precise standards of sex in case of forensic case studies. All the different parts will be summarized in this paper.

# Methods or Design

The research method for this paper comprises of secondary sources for data collection. The data is collected from the different cases which are registered at the FBI Laboratory located in Quantico, VA. There are vast ranges of forensic examinations are performed at the FBI Laboratory through various methods like DNA test, forensic investigations and the production of facial guesstimates. Moreover, the cases used for observation consists of anthropological assessment that is performed on both skeletal material and DNA analysis, after that sex is determined from the amelogenin locus. However, the research does not include the laboratory mistakes, magnification failures and inconsistency with sex identification for analysis. The cases which are chosen for the study only includes anthropological sex determination skeletal fossils. In addition, the other cases that are identified through non-anthropologist studies are not included in this study. Most of the cases that are examined through anthropological examination are conducted exterior of the FBI Laboratory. The data that is finalized is collected from 101 anthropologists for the years between 1974 and 2013.

# Results & Discussion

Results of the study are based on different variables that are used to investigate possible tendencies in the data. All of those are categorized in various categories. These categories include the cases, skeletal data available, sex associates, specialties of the practitioner and the time of the analysis. The tests used for analysis of the data are Fisher's exact and binomial goodness-of-fit tests. These tests helped to identify the significance on the basis of the gathered data. As a result, it was determined that the significance for the study is 0.05. However, the total accuracy rate for 360 cases was examined, and the sex estimation was 94.7%. Furthermore, it discusses that the more skeletal material was used for the analysis and it was identified that the sex estimation precision rate has increased as a result. Moreover, the highest rate for the study positions at 97.8% and the lowest rate is 60.0%. However, for some of the cases, the specific methods used by the anthropologists could not give detail information in order to determine the accuracy rates for some of the particular techniques.

# Conclusion

The results were identified based on 360 forensic cases to create regular rates for sex estimations that conducted by the forensic anthropologists. As a result, the total accurate sex estimation from those cases is 94.7% with an increase of accuracy rates with the availability of the more factual data from skeletal parts. Moreover, it also shows the education level, and the certification of the researcher also influence the accuracy of the result. However, there were 19 incorrect assessments because of only accessibility of one skeletal part. There are various factors which affect the results of the study. The first thing is that there are few unclear sexual assessments taken from the morphological observation. It further concludes that the results of the study are not misinterpreted because of an error rate in the methodologies used for the sex estimation in the forensic anthropology. It also lacks other forms of error. It only overviews the total accuracy of sex determination methods used by anthropologists in forensic cases.

**Part Two**

The results of this study are based on the data collected through the different anthropological methods, used all the material available for the study. However, it has ignored other type of errors which are caused because of the practitioner observation error, method usage error and any other error related to the instrument. There might be chances of error in calculations due to those errors and it may affect the accuracy rates of sex determination. It only focuses on the forensic examinations conducted through anthropological methods. There were other cases having the sex estimation data collect from examination other than anthropological methods. Moreover, a future researcher can consider the forensic examination by non-anthropologists and estimate the accuracy rates of sex estimation. In this research, the accuracy rates for sex estimation will give different accuracy values. Moreover, there will be no use of skeletal material, which cause the altered values for accuracy. The more skeletal material available, the more will be the accuracy rate for sex estimation. In this case, it may affect the accuracy rates of sex determination by using different non-anthropologist examinations.

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