D41 Comparison of DNA Yield From Different Soft Tissues of Decomposed Human Body at 4°C and -80°C

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After attending this presentation, attendees will understand the importance of proper selection of soft tissue from decomposed bodies and proper conditions for preserving it for DNA analysis, especially in developing countries like India.

This presentation will impact the forensic science community by giving guidance about selecting the proper tissue for DNA analysis in case of decomposed bodies and the suitable preservation condition for such tissue. It can improve the outcome of conventional methods of DNA analysis in case of decomposed bodies and can give better results while identifying unknown decomposed bodies by DNA analysis.

It is always difficult to identify dead bodies by just external features in case they are decomposed. Identification by DNA analysis becomes the most important method of identification in such cases. DNA analysis can be easily performed on fresh tissue samples because of very little, if any, chances of degradation of genomic DNA, but it is of real concern to decide the best tissue for DNA extraction and analysis, and then to preserve it at the right conditions for analysis in case the body is decomposed.

Conditions required for preservation of tissues from dead bodies for DNA analysis is of great importance especially in developing countries like India where proper facilities for preservation of dead bodies or tissues are not available at primary and secondary health care centers and even at some of the tertiary health care centers. Also, preservation conditions become important in tropical countries with warm weather which hastens the process of decomposition. Stored samples encounter problems of degradation of High Molecular Weight (HMW) genomic DNA depending upon degree and nature of storage.

The present study is focusing on determining the best suitable soft tissue (among brain, kidney, heart, and muscle) for DNA analysis in case of decomposed dead bodies and the better temperature (among 4°C and -80°C) for the preservation of soft tissue for DNA analysis. The study was conducted on 16 different decomposed dead bodies from which four tissues (brain, kidney, heart, and muscle) were selected for sample collection. The collected samples were preserved at two different temperatures (4°C and -80°C) without any preservative for one month after which DNA was extracted using Phenol Chloroform extraction method (organic method) and the DNA yield was calculated using Spectrophotometer. Quality of extracted DNA was checked using gel electrophoresis, PAGE, and PCR.

The yield of DNA was more at -80°C than at 4°C for all the four tissues collected from 16 bodies. While analyzing the DNA yield for individual tissues, it was found that the yield was remarkably higher in brain tissue followed by heart, then kidney and least for muscles in all the cases at 4°C as well as -80°C. The DNA extracted from all the tissues at both the temperatures was found to be of good quality for amplification purpose with brain having the highest amount of HMW DNA.

This study suggested that deep freezing at -80°C should be preferred for preserving tissues for DNA extraction wherever available and brain must be the preferred soft tissue followed by heart, kidney and then muscle for DNA analysis at both normal freezing (4°C) and deep freezing (-80°C) temperatures.

DNA, Decomposition, Dead body

 ** Presenting Author*