Abstract

Title: Forensic DNA Analysis of material transferred during physical assault

Visita Majithia

The overall aim of this project is to investigate how much DNA is transferred during physical attacks and whether the perpetrator can be identified from this DNA. In order to achieve this we split the project into three phases. Phase I, involved comparison of five commercially available extraction kits to find the most suitable and effective method for use in the project. 10ng of DNA was placed on the cotton swab and then each of the kits was used to extract the DNA. The results revealed the QIAamp Mini kit gave the best recovery. This was found to be statistically significant. This kit was chosen as the method of extraction for the next phases. In phase II the aim was to determine the normal background levels of DNA on the hands of 10 healthy adult volunteers. Both surfaces of the hands were swabbed on ten separate occasions. We observed non-self alleles in at least one profile from all volunteers. In total non-self allele were observed in 38% of the profiles recovered. For phase III the aim was to find out how much DNA can be transferred during physical assault and to investigate the possibility of secondary transfer of DNA. The same ten volunteers from phase II were used. They were asked to punch and slap martial arts pads 1 hour after hand washing. The amounts of DNA transferred were generally low ranging from 0 - 0.7ng for slapping and 0 - 0.29ng for punching. DNA profile recovery was between 0 and 100%. Non-self alleles were observed in 30% and 29% of the profiles recovered from slapping and punching respectively. Overall we observed detectable levels of non-self alleles in profiles obtained from punching and slapping, which could potentially complicate analysis if present in high levels from swabs taken from type of physical assault.