DIFFERENTIAL EXTRACTION USING ERASE SPERM ISOLATION KIT

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Forensic crime laboratories process numerous cases involving sexual assaults. When the victim goes to a health care facility, a sexual assault kit is used to collect body fluids from various cavities. These swabs mostly contain a mixture of vaginal and seminal fluid. If the victim does not report the crime within a few hours, the number of vaginal epithelial cells can overwhelm the spermatozoa from the suspect. In cases of oral assault, a similar situation may occur due to the overabundance of epithelial cells. Normally, a time consuming and cumbersome differential extraction procedure is used in an attempt to isolate the male DNA fraction of the spermatozoa from the female DNA fraction of the epithelial cells. Even after repeated differential extraction steps the resulting DNA profile may still be a mixture of male and female DNA.

The Erase Sperm Isolation Kit from Paternity Testing Corporation can degrade DNA from epithelial cells, leaving the spermatozoa intact. The DNA from the epithelial cells is selectively degraded by a chemical capable of destroying female DNA. This chemical, however, does not destroy DNA within the heads of the spermatozoa. Therefore, it is possible to obtain a single source male autosomal DNA profile from a mixture of seminal and vaginal fluid using the reagents in the kit.

The objective of this study was to validate the Erase Sperm Isolation Kit using post-coital vaginal swabs. Swabs containing a mixture of seminal fluid and vaginal epithelial cells were collected at regular intervals and extracted using the Erase Sperm Isolation Kit. Both the male and the female DNA fractions were processed. The pellet from the male fraction was examined microscopically for the presence of spermatozoa. DNA was extracted from the non-sperm and sperm fractions using two methods: the QIAGEN DNA Investigator Kit and organic extraction. The DNA from both fractions was quantified and an optimum amount of DNA was amplified using commercially available PCR Amplification Kits.

The results of the study showed that complete male and female autosomal STR DNA profiles could be generated from post-coital swabs containing mixtures of seminal and vaginal fluid using the Erase Sperm Isolation kit. The method is cost effective and eliminates labor intensive and lengthy procedures used in regular differential extraction. ⌘