Evaluating the persistence of laundered semen stains on fabric using a forensic light source system, prostate-specific antigen Semiquant test and DNA recovery-profiling

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Abstract

Semen stains on the clothes of victims of sexual assault can remain as evidence even after garments have been laundered. In this study, we aimed to investigate the effectiveness of commonly preferred methods to detect semen stains in two different fabric types that were laundered with different washing machine programmes and washing powders, and to obtain a DNA profile from the semen stains. For this purpose, a comprehensive study was performed on semen-stained underwear using three different methods for stain detection, confirmation and identification: a forensic light source (FLS) system, the prostate-specific antigen (PSA) test and DNA recovery profiling. With FLS applications, stronger fluorescence was achieved in wash protocols performed at a low temperature (30°C) on semen-stained cotton underwear. DNA recovery between 13.45 and 55.00 ng/ml was obtained by modifications in the DNA extraction step when the effect of temperature and washing powder on DNA recovery was evaluated, and these were enough for short tandem repeat (STR) typing in all samples. This study shows that when semen-stained underwear is washed after a month, some semen stains can be determined by FLS and PSA, and all stains can be identified by STR analyses.

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