

Factors associated with trace evidence analysis and DNA findings in police-reported cases of rape

Camilla Forr*, Berit Schei, Lise Eilin Stene, Cecilie Hagemann
Norwegian University of Science and Technology (NTNU), Norway

Background

The medical examination after rapes has two main goals: to provide high-quality care for the victim and to collect evidence that may be used in the crime investigation. Collected samples are sent for forensic analysis upon police request. However, little is known about how the police select cases to be submitted for forensic analysis. Furthermore, few studies report the DNA findings and associated factors.

Aim

The aim of this study was to examine whether victim-, suspect- and rape characteristics, were associated with (1) forensic analysis of trace evidence, (2) detection of spermatozoa and (3) DNA match in police-reported cases of rape/attempted rape. In addition, we explored whether DNA findings were associated with legal outcome.

Methods

We conducted a retrospective, descriptive study based on police-reported rapes and attempted rapes of female victims (≥ 16 years of age) in Sør-Trøndelag Police District throughout 1997-2010. Police data were merged with information from the Sexual Assault Centre (SAC) at St. Olavs University Hospital, Trondheim, Norway. Altogether 324 cases were included. Pearson's χ^2 tests were applied in the analyses. Statistical significance was assumed when $p < 0.05$.

Results

Among 324 victims (mean age $24.2 \pm SD 8.4$ years), swabs and/or clothes were collected from the victim in 299 cases (92%), of which 135 were sent for forensic analysis. The police decision to analyze the forensic material was associated with patient age >18 years ($p=0.047$), a public venue ($p=0.006$) and time from assault to sampling <12 h ($p=0.033$). Trace evidence analyses could be evaluated in 129 of the cases, and were positive for spermatozoa in 79 cases. Among samples collected within 12 h, 90% were positive for spermatozoa ($p=0.003$). In addition, detection of spermatozoa were associated with a penetrative rape ($p=0.006$).

The police collected swabs and/or clothes from the victim and/or the suspect and/or biological material from the venue in 143 cases. Forensic analyses of trace evidence collected from the victim, the assailant and/or the venue revealed 52 cases (36%) with matching DNA profiles and 52 cases (36%) with no matching DNA profiles, whereas 39 cases (27%) were classified as other. DNA match was associated with absence of victim vulnerability factors ($p=0.004$),

the suspect admitting sexual contact ($p=0.001$), victim being known to the suspect ($p=0.009$) and a private venue of the assault ($p=0.011$). A higher proportion of cases with DNA match were charged in a court of law ($p<0.001$).

Discussion

The police requests more analyses and detect spermatozoa in 90% of the cases when the time from assault to sampling is <12 h. Spermatozoa is an excellent source of DNA and is of high forensic importance. When there was a DNA match between the victim and the suspect, a higher proportion of the cases were charged in a court of law. Nevertheless, it is important to always consider DNA evidence in the scope of other evidence.

Conclusions

Our study provides descriptive data regarding trace evidence analysis in rape cases and potential factors that influence this. These results may improve the quality of the medico-legal care.