DNA Analysis Findings From 2,500 Sexual Assault Kits: Implications on Collection and DNA Analysis

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Purpose:
In the United States, sexual assault kits (SAKs) are collected by sexual assault nurse examiners (SANEs) within five to seven days following sexual assaults with victims' consent. Following evidence collection, SAKs are transferred to law enforcement officers responsible for submitting evidence to crime laboratories for DNA analysis (US Department of Justice, 2017). As SAKs often generate DNA profiles of rape suspects, the goal of DNA analysis is to develop DNA profiles to enter into national DNA databases (Magalhaes, Dinis-Oliveira, Silva, Corte-Real, & Vieira, 2015; Wells, Fansher, & Campbell, 2017). In the United States, the Federal Bureau of Investigations (FBI) maintains a national DNA database, Combined DNA Index System (CODIS), of criminals and crime scenes to link DNA profiles (Strom & Hickman, 2015). DNA profiles are considered CODIS-eligible if they meet the FBI guidelines of having a specified numbers of loci for partial or full DNA profiles. The purpose of this retrospective, exploratory study was to determine the percentage of sexual assault kits (SAKs) that developed Combined DNA Index System (CODIS)-eligible DNA profiles and the predicting variables associated with development of CODIS-eligible DNA profiles.

Methods: Retrospective chart review of 5,758 sexual assault forensic medical examinations. Through descriptive statistics and generalized estimating equation (GEE) logistic regression modeling, we found information on SAKS to guide interdisciplinary practices and policies for forensic scientists, law enforcement, prosecution, forensic medical/nursing examiners, victim advocates and policy makers.

Results: We found that 58% of SAKs with short-tandem repeat (STR) DNA analysis developed CODIS-eligible profiles. Swabs most commonly associated with development of CODIS-eligible DNA profiles are as follows (in order): cervical, vaginal, perianal, body and rectal. Variables found to be significant in GEE logistic regression modeling include: female gender, penis to vagina contact, known ejaculation, oral contact of breasts, and time between assault and examination. Additionally, variables found not to be associated with the development of CODIS-eligible DNA profiles were age of victim; time between evidence collection and DNA analysis, indicating a lack of DNA degradation; and if the victim had bathed or showered, indicating that this should not be a factor in deterring evidence collection of DNA analysis.

Conclusion: Our findings add to the limited number of studies exploring aggregated DNA analysis from SAKs. A similar study of 2,500 SAKs found that predictors for development of CODIS-eligible DNA profiles were time between assault and evidence collection (in hours), time between evidence collection and testing (in years), age of victim, and victim-reported consensual sexual activity near time of assault (Kerka, Heckman, Albert, Sprague, & Maddox, 2017). In a study of 350 SAKs, Campbell and

colleagues (2018) found a lack of DNA degradation in testing SAKs collected years earlier as found in our study.

Dissemination of these findings regionally and nationally has shaped evidence collection and DNA analysis practices. The presentation will highlight successful dissemination of forensic nursing research findings to a range of interdisciplinary partners.

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Keywords:
DNA, Forensic nursing and Sexual assault kits

Abstract Summary:
This presentation provides information on DNA analysis findings of over 2,500 sexual assault kits and interdisciplinary policy and practice implications of findings for evidence collection and DNA analysis.

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