B68 The Stability of Semenogelin-I (Sg-I) in Seminal Fluid and Seminal Stain on Various Fabrics Under Various Temperatures

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Learning Overview: After attending this presentation, attendees will better understand information about the stability of semenogelin, especially Sg-I, in human seminal fluid as well as in seminal stains on three types of fabrics (cotton, polyester, and Thai silk) under five different temperatures (-80°C, -20°C, 4°C, 25°C, and 37°C) and nine different time points up to 180 days. This essential basic knowledge can fill the current gap in intelligence about using the Sg-I as a semen biomarker for semen identification to solve any specific forensic issues of sexual assault cases in their daily practice or future research.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by serving as essential knowledge of Sg-I stability in seminal fluid and seminal stains on various fabrics under various temperatures and over different time periods for semen identification in forensic application, especially in rape cases, that has been challenging the forensic community worldwide.

Sexual assault is one of the most acknowledged offenses occurring worldwide, including in Thailand. A successful prosecution of this criminal act needs proof of semen detection. Although sperm identification is essential for seminal investigation as well as assailant identification, its absence may be found in certain cases. Appropriate biomarkers of semen, especially Semenogelin (Sg), are then tested for confirmatory semen identification. Sg contains two forms; Sg-I (52kDa) and Sg-II (71 and 76kDa). Sg-I is the major component of the seminal plasma and the main component of the human semen coagulum. However, Sg-I concentration in seminal fluid varies according to environmental temperature and duration. Little has been known about its stability in the fluid under various conditions. This study was thus aimed at investigating the stability of Sg-I in ejaculated seminal fluid as well as in seminal stain on three types of fabrics (cotton, polyester, and silk) under five different temperatures (-80 °C, -20°C, 4°C, 25°C, and 37°C) and nine different time points up to 180 days using enzyme-linked immunosorbent assay.

The results indicated that Sg-I concentrations either in seminal fluid or in seminal stain declined significantly over time periods and under all temperatures studied. At -80 °C and -20 °C, Sg-I in seminal fluid was still detectable on day 180, approximately 70% and 40% of its original concentration, respectively. At 4°C, 25°C, and 37°C, Sg-I in seminal fluid was still detected on day two but not on day three. The Sg-I in seminal stains was still detectable on day 180 under all temperatures investigated with subsequent lower concentrations. Among the studied fabrics, silk was the most Sg-I-preserved fabric.

In summary, the concentrations of Sg-I either in seminal fluid or in seminal stains were higher at lower storage temperature and in shorter time periods. The Sg-I in seminal stain was much more stable than that in seminal fluid under all temperatures studied. The information obtained from this study would provide a significant insight to forensic scientists for better understanding and more appropriate handling of their case works.

Rape, Semen Marker, Seminal Vesicle-Specific Antigen