



G39 Investigation of Time Interval For Recovery of Semen and Spermatozoa From Female Internal Genitalia

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The goal of this presentation is to investigate time intervals associated with recovery of spermatozoa from various sites of the lower genital tract in adult females thus providing new data regarding the best anatomic site from which to collect evidence in victims of sexual assault.

In cases of rape-homicide, the biological evidence obtained from the body of the victim may be the only link between the victim and the suspect. This biological evidence, in the form of semen and spermatozoa, can provide proof of sexual contact and a genetic profile of the assailant. There is limited data regarding the actual recovery of spermatozoa from various areas of the genital tract. The limited anecdotal case reports available indicate that the cervical os may be the best site for recovery. However, there have not been any prospective studies to evaluate site-specific recovery times, and most standardized kits recommend vaginal pool collection only. Because of the importance of recovering spermatozoa from the female internal genitalia in criminal investigations, the authors undertook the current study to further elucidate the best anatomic site from which to collect evidence in victims of sexual assault.

The study, including the protocol and consent form, was approved by the IRB and the University Human Studies Committee at the University of Louisville. The study population consisted of patients who presented to Planned Parenthood for routine annual examination in Louisville Kentucky from May 1999 through October 2000. Prior to examination by a nurse practitioner at Planned Parenthood, the patient was asked if she would like to participate in the research study. Once consent was obtained, each participant was assigned a number to ensure confidentiality. The participant was asked a series of questions including age, method of birth control, date and time of last sexual intercourse, and history of instrumentation (i.e. douche).

Prior to routine examination and following insertion of the speculum, a nurse investigator from the Office of the Chief Medical Examiner (OCME) used cotton tip applicators to obtain separate specimens from the cervical os and the vaginal pool. Separate smear slides were made from the swabs of the cervical os and the vaginal pool. These were air dried and packaged in containers with the subject's identification number. The air dried cervical os and vaginal swabs were then placed in separate paper envelopes and labeled with the contents and the identification number.

The specimens were transported to the Kentucky State Police Forensic Science Laboratory in Louisville Kentucky for examination by a forensic serologist. The presumptive presence of semen on a portion of each cotton tip applicator was determined by testing for seminal fluid acid phosphatase activity via thymolphthalein monophosphate. An extraction procedure was performed on the cotton tip applicators. The extracted material was placed on a slide, stained with hematoxylin and eosin, and examined microscopically for the presence of spermatozoa. The slides prepared at the time of the examination at Planned Parenthood were also stained with hematoxylin and eosin and examined microscopically for the presence of spermatozoa.

Sixty-one patients participated in this study. Semen was presumptively present on the cervical os cotton tip applicators in 33 of 61 cases. In 1 of those 33 cases, semen was presumptively present only on the cervical os cotton tip applicators. The postcoital time interval in that case was 9.5 hours. The extracted material from the cervical os cotton tip applicators demonstrated spermatozoa microscopically in 17 of 61 cases. In 6 of those 17 cases, spermatozoa were demonstrated microscopically in the material extracted only from the cervical os cotton tip applicators. The postcoital time interval in those cases ranged from 9.5 to 75.5 hours with an average interval of 47.9 hours.

Semen was presumptively present on the vaginal pool cotton tip applicators in 39 of 61 cases. In 7 of those 39 cases, semen was presumptively present only on the vaginal pool cotton tip applicators. The postcoital time interval in those cases ranged from 14 to 95.25 hours with an average interval of 53.6 hours. The extracted material from the vaginal pool cotton tip applicators demonstrated spermatozoa microscopically in 17 of 61 cases. In 6 of those 17 cases, spermatozoa were demonstrated microscopically in the material extracted only from the vaginal pool cotton tip applicators. The postcoital time interval in those cases ranged from 4.5 to 58.25 hours with an average interval of 24.9 hours.

Spermatozoa were observed microscopically in cervical os smears prepared at the time of the examination at Planned Parenthood in 25 of 61 cases. In 5 of those 25 cases, spermatozoa were observed microscopically only in the cervical os smears. The postcoital time interval in those cases ranged from 37.5 to 82 hours with an average interval of 59.7 hours. Spermatozoa were observed microscopically in vaginal pool smears prepared at the time of the examination at Planned Parenthood in 24 of 61 cases. In 4 of those 24 cases, spermatozoa were observed only in the vaginal pool smears. The postcoital time interval in those cases ranged from 17 to 95.25 hours with an average interval of 46.6 hours.

Thus, in summary, there were 2 cases from the cervical os site and 5 cases from the vaginal pool that



Pathology Biology Section – 2003

would have been missed, had the other collection site not been included. The total number of cases from which only one site was positive was 7 of 61, or 11.4 per cent.

The information gained from this study suggests that biological samples should be collected from both the cervical os and the vaginal pool in victims of sexual assault. It also suggests that, on average, spermatozoa may be recovered from the cervical os after longer postcoital time intervals than from the vaginal pool.

Semen, Spermatozoa, Female Internal Genitalia