Clinical Forensic Medical Practice that Detects Semen

Stephen Peterson*

Editorial Office, Journal of Forensic Pathology, UK

Corresponding Author*

Stephen Peterson

Editorial office, Journal of Forensic Pathology, UK

E-mail: forensicres@theresearchpub.com

Telephone: +44 7915641605

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Abstract

Finding and recovering biological evidence that can be used to establish a connection between the offender and the complainant is one of the main goals of forensic investigation into sexual offences. The use of an Alternate Light Source is one potentially useful technique by which trace biological evidence may be recognised in different forensic circumstances (ALS). The purpose of this study was to ascertain whether or not employing an ALS as an adjunct during sexual assault examinations could help with the identification of forensically important body parts that are difficult to identify during visual inspection for sample. We provide two case reports that demonstrate the potential benefit of utilising an ALS as an adjunct in clinical forensic medical practise. sexual assault examinations to find regions of skin that could be forensically useful to sample for semen. We conducted a number of quick laboratory studies to establish a methodology for the use of the ALS before integrating it into our clinical forensic medical practise. Semen has been observed to glow using an ALS at 450 nm. Even if we didn't carry out a careful We tested the method's effectiveness using an ALS to find semen on a variety of inanimate objects and people skin. Reduced light source distance from the surface and increased semen concentration on the surface increased the visibility of fluorescence on all surfaces, but the angle at which the light source was held in relation to the surface had no discernible impact.

Introduction

Several research have used an Alternative Light Source (ALS) fitted with excitation filters to identify trace evidence, body fluids, and fingerprints. These investigations focused on biological fluid fluorescence and stains on inert materials. Neither did they show the value of detecting biological material on human skin or provide instructions for using an ALS in a clinical context. A study that compared the use of an ALS to find recently defecated urine and semen on skin and fabric more recently has called into question the utility of an ALS in clinical practise. The authors of this research also give a thorough explanation of the several lighting options that can be used in a forensic environment, making specific reference to a recent paper that questioned the effectiveness of a Wood's Lamp in fluorescing semen. Any method that makes it easier or improves the ability to identify forensically useful areas on the body from which to sample could be of significant value. Detecting and sampling biological material with the potential to link subjects is one of the main goals in the forensic examination of subjects in sexual offence investigations. The use of an ALS on both inanimate objects and human skin is covered in the first section of this study. The second section covers two clinical situations where the use of an ALS to guide the collection of forensic samples from a sexual assault complainant's body was determined to be forensically valuable [1-3]. The subjective visibility of fluorescence was found to be increased on all surfaces, including human skin, by decreasing the distance between the light source and the target surface as well as by increasing the concentration of semen. However, the angle at which the light source was held in relation to the surface had no discernible effect. Using the ALS in a lab context to detect fluorescence on human skin, several false positives were noticed; two of these could be quickly identified with the unaided eye as patches of thickened or dry skin, and one was mistaken for "hand cream." Despite not producing sperm, one of the fluorescent areas swabbed in the first case study resembled the other fluorescent area, which produced many sperm heads. This means that additional content in the It is possible for the vaginal region to glow and resemble semen. It is important to keep in mind that the ALS is not semen-specific and that any dried biological substance might theoretically glow [4-5]. As the fluorescent spots might be claimed to have been inside the general area that would be swabbed normally, the fact that the ALS was used to direct swabbing before the collection of routine genital swabs may have decreased the yield of semen from the usual non-ALS directed swabs collected later. We do not, however, believe that this disproves their future worth. The decision to use the examination protocol was made in an effort to prevent the partial removal. Given that greater quantities of semen are more likely to fluoresce, by taking a regular swab of the sample, a less concentrated deposit of semen may be left behind that may not have been noticed by the ALS. A single swab with more semen on it will probably produce more sperm when it is analysed in the lab. Additionally, the possibility of simultaneously collecting epithelial cells from the individual in addition to semen increases when greater areas of skin are wiped instead of more precisely defined, smaller areas. This decreases the 'purity' of the sperm material on the swab. During normal forensic swabbing, clinician variation in both the pressure utilised and the amount of swab contact with the skin of the external genitalia should be acknowledged. Even with extra caution, forensic sample from the exposed genital areas, particularly the labia, can be challenging [6].

Even with the best of intentions, routine cotton swabbing won't always make contact with all of the inner thigh skin when sample from sections of skin that are bigger, such the inner thigh. When swabbing a broader area "blindly" as compared to a smaller, more precisely defined luminous area, there may be a difference in the pressure applied to the skin and, consequently, in the possibility of collecting particles. The dried blood was easily visible in ambient light and did not obstruct the ALS's ability to detect fluorescent spots because it appeared dark at that wavelength (450 nm). An ALS may be helpful in directing the forensic medical examiner to regions of particular interest for forensic sample, even if the definitive nature of any areas of fluorescence cannot be ascertained on visual inspection and will always require laboratory analysis for identification. An ALS may optimise the collection of forensically valuable samples in the situation of a complainant who provides a history of suspected ejaculation but where semen cannot be readily visualised upon initial examination. This could be especially helpful in situations when there are claims that ejaculation has occurred on areas of the body other than the vaginal region. Directed sampling is more likely to produce useful amounts of data than restricting swab collection to the "blind" swabbing of broad areas of skin, such as the abdomen or chest, where a complainant "thinks" ejaculate may have landed. Both of the aforementioned case studies demonstrate the potential advantages of using an ALS in addition to the customary forensic samples obtained as part of the majority of sexual assault forensic examination processes. However, they do indicate that it might be beneficial as a screening tool before the collection of routine swabs for the reasons mentioned above. It should be noted that the authors do not advocate using the ALS in place of the standard forensic sample methodology. To find other materials that might glow, more research into the ALS's usage in clinical forensic medical practise is necessary.

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We thank the patient for allowing the case description.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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