Martha Goddard: The woman who revolutionized sexual assault forensics

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Abstract: Martha Goddard had an invaluable impact on the field of forensic science. She was a victims' advocate who desperately wanted to change the investigative approach toward sexual assaults. In the 1970s, law enforcement was trained to believe that women who were raped lacked decency and morality. If a rape case ever made it to a courtroom, the victim was painted as a scorned lover wanting revenge on a man with a roving eye. Before the era of DNA testing, lack of evidence posed the greatest challenge to reaching a guilty verdict for the defendant. The government could not reach a guilty verdict with little or no physical evidence connecting the defendant to the crime. No consistent methodology had been established regarding the collection of evidence in a rape case. If evidence was collected, it was often inadvertently destroyed or cross-contaminated. Martha Goddard pioneered the first rape kit that established a clear and methodical manner to collect evidence from a victim. That evidence could then be used to positively identify the defendant, creating a more prosecutable case. Victims of sexual assault now had the means to prove the guilt of their perpetrators. Those who fell prey to sexual offenders were no longer subjected to cruel misperceptions of their virtue. Instead, blame was now being placed where it belonged, on the offender.

Keywords: sexual assault, women in forensic science, sexual assault evidence, rape kit, Martha Goddard

Introduction

To recognize the importance of the sexual assault evidence kit, or rape kit, you must first understand the woman behind its invention. Martha Goddard first recognized the need for an evidence collection kit when she volunteered at a local Chicago crisis center in the 1970s. Goddard would often lend an ear to child victims of sexual abuse who had grown used to being ignored. After hearing their stories, Goddard realized this abuse was perpetuated by the belief of the times in which she was living: incest was typically initiated by daughters who were seducing their fathers (1).

This mindset spilled over into the way law enforcement officers were trained to investigate a rape case. A 1973 Chicago police training manual said, "Many rape complaints are not legitimate. It is unfortunate that many women will claim they have been raped in order to get revenge against an unfaithful lover or boyfriend with a roving eye. An actual rape victim will generally give the impression of a person who has been dishonored" (1). When officers did respond to a rape, they would often drop the victim off at a hospital lobby, staying just long enough to notify personnel they had a rape victim needing treatment. Nurses would then wash the victim, tend to their wounds, and discard soiled clothing, unintentionally destroying valuable evidence. Goodard realized that evidence needed to be collected in a manner that would maintain its integrity and give veracity to these victims' claims. She envisioned a kit stocked with everything one might need along with careful instructions on collecting the evidence from the victims. By stocking the kits with affordable supplies such as brown paper bags and cotton swabs, she would keep the kits affordable, thus encouraging their use in evidence collection (1).

When Goddard pitched her idea to Rudy Nimocks, an African American police officer, he warned her the men in the crime lab may be insulted with her idea and refuse to work with her. Instead, he advised her to approach Louis Vitullo, a Chicago police sergeant who would later serve as the head microanalyst in Chicago's crime lab. When Goddard presented Vitullo her written description of the kit, he became angry and screamed at her, dismissing her suggestions, and accusing her of wasting his time. Vitullo's response was not far-fetched, as police officers had been trained that rape cases were virtually impossible to prove, and the evidence was useless. Despite Vitullo's initial angry reaction to Goddard, he was clearly intrigued with her idea. After being left with her rape kit plans, he spent days looking over the proposal and created a prototype. When he was satisfied, he met with Goddard and presented her with his work, proud of what he considered was his invention (1).

With Vitullo's close association with the Chicago police department, the implementation of the new rape kit was heralded as a brilliant collaboration between the department and the state attorney's office. Goddard knew the kit's full potential would be hindered if it were backed by a woman with no formal forensic training. As a result, she helped start a nonprofit group, Citizens Committee for Victim Assistance, which later filed the Vitullo Evidence Collection Kit's trademark in 1978. Goddard's name would never go on her own invention (1).

Goddard forced the court to see sexual assault as a serious crime with real victims. A victim's virtue was no longer on trial. Physical evidence, that could be corroborated with testimony from lab technicians, provided credibility to the victims' claims. Juries were impressed with the kit's uniform approach to the collection and preservation of evidence. By the end of the 1970s, almost 3,000 kits had been submitted to crimes labs across the nation. One of the submitted rape kits led to a 60-year prison sentence for the offender (1).

Evidence Collection and Analysis

Sexual-assault evidence can be collected from both the crime scene and the victim. Groups and organizations like the Scientific Working Group on DNA Analysis Methods evaluate forensic methods and protocols to ensure that agencies worldwide can have the latest information and training available for their criminalists (2). A sexual assault exam can be requested by the victim and is ideally conducted within the first 72 hours following the assault and prior to the victim bathing or using the restroom. The victim's clothing and personal belongings are placed in a paper bag to help preserve the evidence and any injuries requiring medical attention are treated. In addition, photographs may be taken to document the injuries. Swabs are taken of the mouth and/or vagina and blood and/or urine specimens and hair samples are collected. In addition, a cheek swab will be taken from the victim and any suspects, if known. During the exam, the victim might be asked questions regarding the incident and offered follow-up treatment, such as preventative treatment for sexually transmitted infections, emergency contraception, and counseling services (3). Evidence collected from the victim will be placed in a serialized rape kit envelope and sent to a lab for analysis. If a sample from the suspect is collected, it is also sent to the lab, but not contained in the rape kit envelope. Once the kit is received by the lab, it will be tested for the presence of male DNA. If no male DNA is detected, the analysis is complete, and the kit is returned to the reporting agency. If male DNA is detected, the evidence will be sent for the four steps of DNA analysis: extraction, quantitation, amplification, and genetic analysis (4).

During extraction, a criminalist will extract DNA from the vaginal swab and cheek swabs from the victim and suspect, if provided (4). Cells are broken open, DNA is released, and impurities are removed. This process is called Differential Extraction. Female cells are incubated in a Sodium Dodecyl Sulphate (SDS) and proteinase K mixture, which causes them to break down their cell membrane. The mixture is centrifuged, which causes the sperm cells to sink to the bottom of the microcentrifuge tube and form a pellet. The liquid is then removed. The sperm cells are treated with an SDS, proteinase K, and dithiothreitol (DTT) mixture. It is not incubated because the DTT in the mixture organically breaks downs sperm cell membranes. In cases where a perpetrator has had a vasectomy, differential extraction cannot be used to separate semen without sperm cells from female DNA. In these cases, Y-chromosome-specific markers will be used to test for the presence of male DNA (5).

During quantitation, a criminalist can find how much DNA is present, if it is degraded, if impurities are present, etc. Quantitation ensures that an amplifiable amount of high-quality human DNA was recovered during extraction. Quantity is just as important as quality during amplification. If the sample is too degraded or contains too much DNA, analysis can be near impossible (4).

Amplification uses real-time Polymerase Chain Reaction (PCR), the results of which are shown in a few hours. PCR is the process through which short repeating segments of DNA bases are multiplied. The segments are called short tandem repeats (STRs), the regions of DNA that individualize people at the genetic level. PCR primers used during the amplification process are fluorescent single strands of synthetic DNA that anneal to base sequences surrounding STRs. PCR amplification is faster and more sensitive than other methods of DNA amplification and involves cyclical heating and cooling of samples. During a thermal cycle, the STR sequence is duplicated (5).

Genetic analysis involves taking the amplified product and putting it in a genetic analyzer, which applies electricity to a gel, causing the amplified PCR products to travel through the gel. The amplified DNA is separated by size and color of the fluorescent primers. These amplified DNA segments are recorded as peaks on an electropherogram. The analyzer software converts this raw data from the electropherograms into easier-to-read analyzed data and displays the results as a DNA profile (4). Gene Mapper ID-X (Applied Biosystems ™) is the current analysis software used by most agencies. The software's findings will then be verified or disputed by a criminalist (4).

After interpreting the data, a criminalist will finish their analysis by generating a population statistic, which shows the probability of the suspect sharing the same DNA profile as another individual. To generate a population statistic, a population database is needed (3). Blood from a local blood bank can be collected for this database if the agency wishes to have a local statistic (4). The National Institute of Standards and Technology also publishes

population data that has helped the Forensic DNA Typing community for over 20 years (6).

While the development of DNA testing has enhanced the initial objective for the rape kit, it has further complicated the analytical process, leading to a nationwide backlog. The two main sources of this backlog appear to be 1) the evidence was never sent to a crime lab or 2) once it was sent it was never tested. Non-profit organizations such as the Rape, Abuse & Incest National Network (RAINN) have discovered the backlog and raised national attention regarding the stockpile and the number of dishonored victims it represents. By educating lawmakers, providing technical support, and demanding accountability, these organizations are committed to eliminating this backlog and restoring justice for these victims (2).

Conclusion

The story of Martha Goddard is an unfortunate reminder of how little respect women received in previous decades. In the 1970s, women were forced into traditional roles such as a homemaker, mother, and wife, while just two decades before, they left their homes to help their country during a war. The women's rights movement inspired women to challenge society's definition of gender roles, eventually leading to the anti-rape movement (7). Now given basic human rights, women were ready to place blame where it belonged, with the rapist. Victims came forth from the shadows to seek justice after spending decades in shameful silence. Today, women have joined hands with male victims of sexual violence to prove that their stories matter, too (7).

But even Martha Goddard, the woman behind the rape kit, was unable to escape from the stigma surrounding sexual assault. After returning from a trip to Hawaii, she called her friend Cynthia Gehrie and told her she was raped. Goddard's assailant first gained her trust by pretending to be a fellow advocate for the rape kit. He then lured her into his vehicle and drove her to an isolated area at the resort, while Goddard begged him to let her go. After he finished raping her, he drove her back to the resort and, much to Goddard's surprise, released her. Goddard later discovered she had contracted herpes from her attacker (1).

Despite Goddard's consistent dedication to the cause, societal shame surrounding rape persisted. While training law enforcement officials to use the newly implemented rape kits, Goddard was forced to listen to degrading assumptions made about the victims. Horribly discouraged, Goddard retreated into herself and died in obscurity in 2015 after a lengthy battle with alcoholism. Her friends were unaware of her passing for many months. Her nephew was the only person who came to collect her belongings. Goddard was not appreciated for her talents, nor was she given any of the recognition that she deserved for her contributions to the Forensic Science community. Martha Goddard, much like her invention at the time, was undervalued and underappreciated by the very group of people she was trying to help (1).

Acknowledgements

We would like to thank Leah Simmons for the many hours of encouragement and helpful suggestions regarding this topic. We also thank Dr. John Mabry for his mentorship and guidance in highlighting such a monumental story. Thank you to Dr. Dwight Adams for providing a supportive learning environment for both students and faculty. We would be remiss if we did not thank Martha Goddard for her bravery and innovative spirit that left its lasting impression on the world of forensic science.

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