CURRENT SITUATION OF CHILD ABUSE IN JAPAN AND EFFORTS TO OBTAIN OBJECTIVE EVIDENCE OF BRUISING FROM CHILD ABUSE

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Abstract. Child abuse in Japan has become a social problem, with yearly increases in the number of consultations at child consultation centers. Of the four classifications of child abuse (physical abuse, neglect, sexual abuse, and emotional abuse), Japan has seen a particular increase in emotional abuse. Capturing evidence of child abuse is difficult. Generally, photographs are used as evidence, but the photography requires instructions. Three studies are introduced with alternate methods to enable bruising to be used as evidence of child abuse. First, spectrophotometry is used to digitize the color of skin, and provide scientific evidence of the co-existence of old and fresh bruises. Second, the diagnostic equipment of ultrasonography is used to evaluate the depth and thickness of subcutaneous hemorrhages that are due to bruising and which decrease over time after the bruising had occurred. Ultrasonic diagnosis can evaluate both the depth and thickness of such subcutaneous hemorrhages and illustrate the healing process. Third, forensic light source was used, which effectively uses violet light to enhance the visibility of bruises over time, even after old bruises become yellowish and can be hard to differentiate with the naked eye. These methods are useful for visualizing bruises and for capturing the evidence of child abuse. The methods are currently under study, but application in a clinical setting is expected.

Keywords: child abuse, child consultation centers, bruise, spectrophotometry, ultrasonography, forensic light source


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I. CURRENT SITUATION OF CHILD ABUSE IN JAPAN

There are 212 child consultation centers in Japan, where 159,850 consultations for child abuse cases have been provided between April 2018 and March 2019 [1]. A continuous annual increase in the number of consultations at these centers has been observed; the number was 6,932 in 1998, which has increased by approximately 23 times in the last 20 years. The number of consultations particularly increased at a rapid rate in 2000 (the year in which the law on child abuse was enacted), and saw a similar increase in the years 2003 and 2010, following the report of a horrible case of child abuse.

In Japanese Act on the Prevention of Child Abuse classifies child abuse into four types: physical abuse, neglect, sexual abuse, and emotional abuse [2]. Physical abuse is defined in general terms as "any non-accidental physical injury to the child," and includes striking, kicking, burning, or biting the child, or any action leading to physical impairment. Neglect is defined as the failure of a parent or any other person with responsibility for the child to provide necessary food, clothing, shelter, medical care, or supervision to the degree that the child's health, safety, and well-being are not threatened with harm. Sexual abuse occurs when a child is raped or forced to commit a sexual act and includes touching a child's genitals or making a child touch someone else's genitals, making a child pose or perform for pornographic pictures or videos, showing pornographic materials to a child, and so on. Emotional or psychological abuse is defined as a pattern of behavior that has negative effects on a child's emotional development and sense of self-worth, and includes ignoring a child or withholding love, support, or guidance.

The number of consultations for emotional abuse in particular has remarkably increased in Japan in the recent years. One form of emotional abuse is domestic violence, which is inflicted on a spouse in a home wherein children live. Since 2015, when the 3-digit phone number (189) to reach the child consultation centers was made available for the first time, there has been an increase in awareness regarding child abuse, with a subsequent increase in the number of relevant consultations. This has led to an increase in the workload of the staff at these consultation centers.

II. PHOTOGRAPHY OF THE EVIDENCE OF ABUSE

When child consultation centers receive notice of a child abuse case, they ensure the security of the child by temporarily protecting the child if abuse is suspected. Generally, however, it is difficult to obtain evidence of child abuse. In medical certificate of injury, though a written description of physical findings remains an important aspect of child abuse documentation, photography is a common method used to provide evidence of child abuse [3]. Yet, staff who are unfamiliar with the nuances of photography usually do not achieve a sufficient level of camera focus and brightness when taking photographs. Therefore, multiple scans become necessary and include more than two views of photography, including a wide area view and a macrophotograph of the injury. It is also recommended that staff place a scale near the injury in a macrophotograph and, because young children do not remain still for photographs, staff also need to time the photograph so that it is taken in moments when the child remains still, usually achieved by giving the child a toy. The child consultation centers sometime request for forensic pathologists, who provide a medical certificate of injury as evidence for the wounds, in case the child has a wound, for the purpose of examination. Forensic pathologists routinely record injury findings, and are experts at speculating the weapon that was used. Moreover, forensic pathologists are required for created a legal document for the case.

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time. In this study, we found that it is possible to accurately measure the depth from the skin surface to the subcutaneous hemorrhage, and the thickness of the subcutaneous hemorrhage, using ultrasonography.

3. The visualization of an old bruise

Bruises in children heal quickly. It is difficult to confirm an old bruise because once it heals, it leaves no evidence to photograph. Some researchers report using ultraviolet (UV) radiation to irradiate an old bruise and then visualize it [8–14]. However, UV rays have harmful effects. There should be hesitation in using harmful UV radiation on healthy children, even if the purpose is to ensure protection from abuse. Therefore, the investigation of the optimal wavelength to visualize old bruises in children was initiated [15]. In this study, four forensic light sources (UV, violet, blue, and blue ring light) were compared. The results indicate that the time interval for which the bruise could be observed under violet light was significantly longer compared to other types of light. Although the bruise could not be observed under the visible ray because it has healed, we could observe the bruise under the special light wavelength. The observation under violet light was possible for a longer time and was clear. The bruise presented as xanthochromia during the healing process, and the observation of the old bruise under the visible ray was limited. We believe that this was caused by the fact that yellow and purple are combinations of complementary colors. This study showed that short wavelength lights were not superior in the visualization of old bruises. Violet light has a longer wavelength than ultraviolet rays and could visualize old bruises clearly. Violet light is also less harmful than ultraviolet rays.

IV. CONCLUSION

It is important to retain objective evidence of abuse in order to protect abused children. Injuries in children heal quickly, therefore they must be examined early and the evidence of the abuse must be obtained. We also suggest that considerable effort should be channeled toward performing minimally invasive antemortem examinations in children. Pain, fear, and excessive suppression are not suitable for the proper examination of children.

Of course, the examiner should ask a parent and a child how the bruise occurred, however, children may not tell the truth in front of their parent. Therefore, it is necessary for the examiner to ask a parent and a child separately. The contradiction of the explanation by a parent or the child coupled with the objective evidence may lead to a diagnosis of the cause of the abuse.

I forward these studies for visualizing bruises and for capturing the evidence of child abuse. These methods are still in the research stage, but will be available for practical application in the future.

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