Shaken Baby Syndrome: An Underdiagnosed Problem

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Abstract

From 1990 to 1994, the number of child abuse cases increased 27%. Many current child abuse education courses typically focus on evaluating external signs and history of injury. Shaken Baby Syndrome is a specific form of child abuse that frequently goes undiagnosed or misdiagnosed because of a lack of physical or external signs. To become sensitized to this issue, optometrists must be aware of the ocular and neurological signs of this form of child abuse so that proper referrals and care is received. This article will review the signs and symptoms of Shaken Baby Syndrome and presents a report of a shaken child. Also covered is a brief review of how to evaluate a suspected child abuse victim.

Key Words

Shaken baby syndrome, child abuse, infants, children, retinal hemorrhages, retinal detachment, pupil defects, visual field defects, and optic nerve defects

Most, if not all, states currently require optometrists to complete a child abuse awareness course as a requirement for licensure. These courses educate one on how to properly evaluate different types, colors, and locations of external injuries, and when to be suspicious of a parent's "history" of the injury. As will be discussed in this article, Shaken Baby Syndrome (SBS) is a unique form of child abuse. It is frequently missed when using the methods taught in child abuse courses due to the lack of external signs.

Some unfortunate statistics on child abuse were revealed in the U.S. Department of Health and Human Service's report entitled, "Child Maltreatment 1994: Reports from the States for the National Center on Child Abuse and Neglect." Since 1990, confirmed child abuse cases have increased 27% over four years, from 800,000 in 1990 to 1,012,000 in 1994; almost half of the victims were under the age of 6 years. Over 25% were under 3 years of age. Of the more than one million children, over half (53%) were neglected, approximately one quarter (26%) were physically abused, 14% of the children were sexually abused and 5% were emotionally abused. All other forms of child abuse were found in 22% of the cases. One can see that the percentages add up to more than 100%. This is because victims of child abuse frequently suffer more than one form of abuse.[1]

SBS is a specific term used to describe a form of child abuse in which the child, or infant, is injured secondary to violent shaking.[2-4] Most often, the child is between 2 and 18 months of age at the time of abuse.[3,5] The rapid acceleration and deceleration of the child's head going back and forth causes ocular trauma and neurological damage to the soft tissue of the brain.[6] Typically, a child will present with one or more of the following neurological signs: developmental delays or halted development after the episode, history of seizures, mild to severe paralysis, general failure to thrive, lethargy, hypothermia, bradycardia, and/or listlessness.[3-6] The ocular signs are often purely retinal or neurological in nature and will not be part of the chief complaint of the parent, nor will it be apparent without the appropriate fundus evaluation (hence our importance in the diagnosis versus other medical professionals).

External signs of abuse, such as bruises, cuts, or broken bones, are rare in SBS. If external signs are present, they are usually in the form of bruises on the midsternum, or shoulders, where one might grab the child prior to shaking.[5] Ocularly, the most common finding is retinal hemorrhaging , with preretinal hemorrhages being the most common. However, as with most retinal hemorrhages, they are short lived and will frequently not be present one to two months after the episode of abuse. Other ocular signs that may be present include optic nerve head sheathing, optic pallor or atrophy, reduced or unreactive pupillary re-

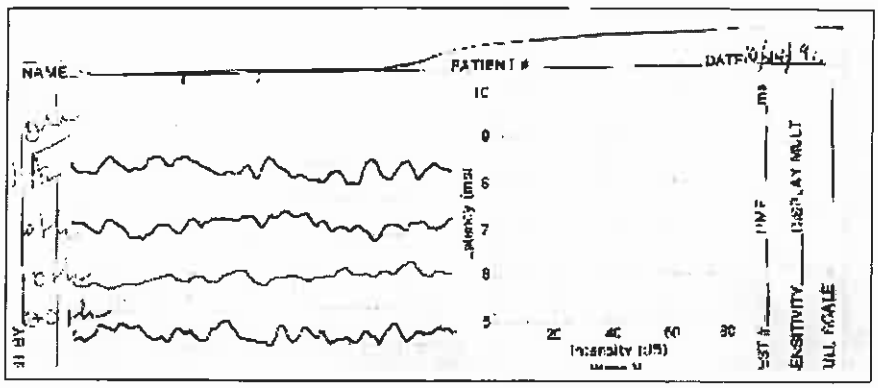

Figure 1: The VEP revealed only noise in the visual system. No true visual response was elicited.

sponses, poor or random ocular motilities, mild to severely reduced visual acuities, retinal folds, retinoschesis, retinal detachments, and visual field defects.[3,5-7] Because of the ocular findings, optometrists and ophthalmologists may be the first, or only, doctor to examine the child and begin to suspect the *true* cause of the child's problem.

Case Presentation

A 2-year-old child came to our clinic for a comprehensive eye exam. The mother stated that her child was abused (via shaking) by the father at 3 months of age. She reported that a Visually Evoked Potential (VEP) was performed 6 months earlier and revealed that her child could not see. She did not believe this and was seeking a second opinion.

The child's birth was not complicated and development during the first 3 months of life was completely normal. However, the child's development had not progressed since being abused 18 months earlier. No gross motor milestones had currently been reached. The child was non-verbal and only capable of making grunting sounds. After being shaken, the child was placed on Phenobarbital for seizures. He was taken off the medications at 1 year of age and had not had any seizures since then.

Just after the child was shaken, the right lid was said to be completely shut for approximately one month. For a short time after that, both lids appeared normal. At about his first birthday, his left lid began to become ptotic. At the time of testing, the child presented with a partially ptotic left lid. While taking the case history, the child was feeding. Careful observation revealed that the right eye would open and close slightly during feeding, indicating a Marcus Gun Jaw Winking form of aberrant regeneration. The child's pupillary responses were sluggish, both directly and consentually. An anisocoria was noted, with the left eye being larger than the right. A cover test showed a variable exotropia with a significant (approximately 12Δ) right hypertropia. Ocular motilities were random with no signs of restrictions. The child would not attend to any target that was presented, including highly saturated colored objects, faces, checkerboard patterns, toys, or lights. Furthermore, he did not fixate on a single penlight in an otherwise dark room, nor show any response to having the room lights flickered on and off. Retinoscopy revealed +2.00 D, OU and there were indications that hearing deficits were present. The child did not respond to any loud noises throughout the exam and he responded only to the sound of fingers rubbing together when they were very close to his ears. Slit lamp evaluation revealed no abnormalities. Upon dilation, foveal reflexes were noted in both eyes. The optic nerve heads were somewhat pale in both eyes, with cup to disk ratios of 0.35 OD and 0.40 OS. Vasculature was of normal caliber and no signs of hemorrhaging were noted. No retinal detachments, retinoscheses, or retinal folds were seen and the media were clear OU.

At the conclusion of the exam, the impression was that there was no severe damage to the eyes. Based on the ocular motilities, pupils, and child's visual responses to stimulation, the child was considered to be cortically blind secondary to neurological damage. A VEP (Figure 1.) was conducted. The results are essentially flat and support the impression of both our exam and the conclusions made by the doctors who performed the initial VEP.

Discussion and Summary

The above case outlines some of the possible presenting signs of a child who has been abused by shaking. In the optometric examination of a child suspected of having been abused, the history and appearance of the child are quite important. Document the nature of the problem exactly as told by the parent of the child. Does the presenting "story" match the clinical picture? The severity of the signs should correlate with how the parent describes the child's condition. Note the location and color of injuries; fresh bruises tend to be dark blue or purple while older bruises get browner and yellower. Bruises on the arms and legs can be due to a true injury, but can also be the location of where a child was forcefully grabbed or held. Review the following when observing the patient:

- Are there any injuries to the face or scalp that correlate logically to the case history?
- Have any other children in this family presented with similarly questionable injuries or visible bruises?
- Does either parent have any bruises or other visible injuries?

These, as well as similar types of questions, should be kept in mind while evaluating the patient.

During the examination, be aware of the typical neurological signs of a victim of SBS. These include listlessness, vomiting, hemiplegia, and a general failure to thrive. Bradycardia and hypothermia may also be related to an abused infant. All of these can either be investigated during the case history or directly observed.

When evaluating the child, begin by observing any deficits in the ocular motilities. Look for any limitations in movement, nystagmoid movements, randomness of eye movements, and quality of oculomotor control. Some or all of the preceding may be observed. Also evaluate the pupillary responses for neurological damage. Dilate the child and look for any signs of retinal hemorrhaging, retinal folds, or retinal detachments. Thirty to forty percent of abused children will have ophthalmic findings.[4] Note the type and extent of ocular damage and hemorrhaging. Look for hemorrhages that are at various stages of resolution, possibly

indicating repeated abuse.[3] Observe the optic nerve heads for possible sheathing or pallor. Take appropriate measures to determine the visual acuity. Depending on the severity of retinal damage, you may note either a moderately decreased or severely reduced visual acuity. In patients with retinal folds or hemorrhages, the vision is usually only moderately affected. If there is a hemorrhagic retinoschesis, inner retinal ischemia, or complete retinal detachment, the vision will be severely affected. Visual field defects are going to be influenced similarly to acuity.

The diagnosis of SBS is one of exclusion.[2] When presented with a patient that fits the described clinical picture, begin to rule out other possibilities. Accidental trauma (car accidents being the most common) or birth trauma present exactly like a child who has been shaken.[5] Other, less common, differentials are leukemia, sepsis, and any type of clotting disorder.[2,6,8] If one of these cannot be implicated as the cause of the trauma, one must suspect child abuse as a possible cause of the child's condition.

Conclusion

Once you are suspicious of child abuse, by law it must be reported to the Child Welfare Services. However, it is *not* your job to determine if a child has in fact been abused. This is the job of Child Welfare Services. Failure to report a suspected case of child abuse puts that child, any of his or her siblings, and possibly a parent in danger of continued abuse at home.

To report a case, contact the Child Abuse Hotline at 1 (800) 635-1522. Have as much of the following information as possible:

1) The names of all the people in the household
2) The names and ages of all the children in the household
3) A *solid* address. A home address is preferable. If this is not possible or is unavailable, obtain the patient's insurance information, i.e., plan, name, and number, so the child abuse agency can attempt to trace back to the household.
4) Provide as comprehensive a family history as you can obtain.

When reporting, you will be asked to provide the agent with your name, for the record. The agencies all promise to keep your name confidential.

For more information on this subject, contact your local center for child abuse and battered women. The phone number can be located on the inside cover of most Yellow Page Directories.

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