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REVIEW ARTICLE.....!!!

WHIPLASH SHAKEN INFANT SYNDROME**S.Elizabeth Benita.^{1*}, Vedhapal Jeyamani.S², Gokularam.S¹, Sripadh Ramachandran³**¹4th Yr Pharm.D, Jaya College of Pharmacy, Chennai,²Department of Pharmacy Practice, Jaya College of Pharmacy, Chennai³2nd Yr, Department of Biomedical engineering, St.Peters University.**KEYWORDS:**

Subdural and retinal injury, glial cells, Intellectual disability, Abusive head trauma, Shaken impact syndrome, Inflicted head injury, clinical pharmacist.

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ABSTRACT

The shaken baby syndrome was once a undefined and challenging case. To detect the proper death cause behind the child's increased mortality rate caused by abuse occurring in the late of 19's was really confusing. People of that age blindly believe that shaking the baby while crying will stop them from weeping and induce the baby to sleep. In this review, the pathophysiological origin, aetiology, clinical signs, management, investigation, diagnosis, and prevention was discussed below to increase the awareness among the public to prevent the accidental mishandling of the infants.

INTRODUCTION:

The shaken baby syndrome was caused by serious neurological injury due to child abuse and was the common cause of death specific to infancy. Subdural and retinal injuries were noted as markers for shaking injury. A British neurosurgeon named, Guthkelch was the first one to describe shaking serves as the cause of subdural haemorrhage in children. The recent development in a the field of radiology department gave profound proof to justify the cause of brain injury was known as hypoxic ischemic encephalopathy. The conformation of the shaking syndrome was done by the imaging technique known as magnetic resonance imaging which was the sensitive method which involved in the conformation of the shaken baby syndrome. Social welfare agencies plays a vital role in investigating the subdural haemorrhages running in families, which helps in prevention of shaken baby syndrome.

DEFINITION:¹⁻²

- ❖ Shaken baby syndrome was known as abusive head trauma, shaken impact syndrome, inflicted head injury is a serious brain injury resulting from forceful shaking or mishandling of an infant or an toddler.
- ❖ It was also defined as the permanent brain damage done to the infant or an toddler due to forceful shaking.

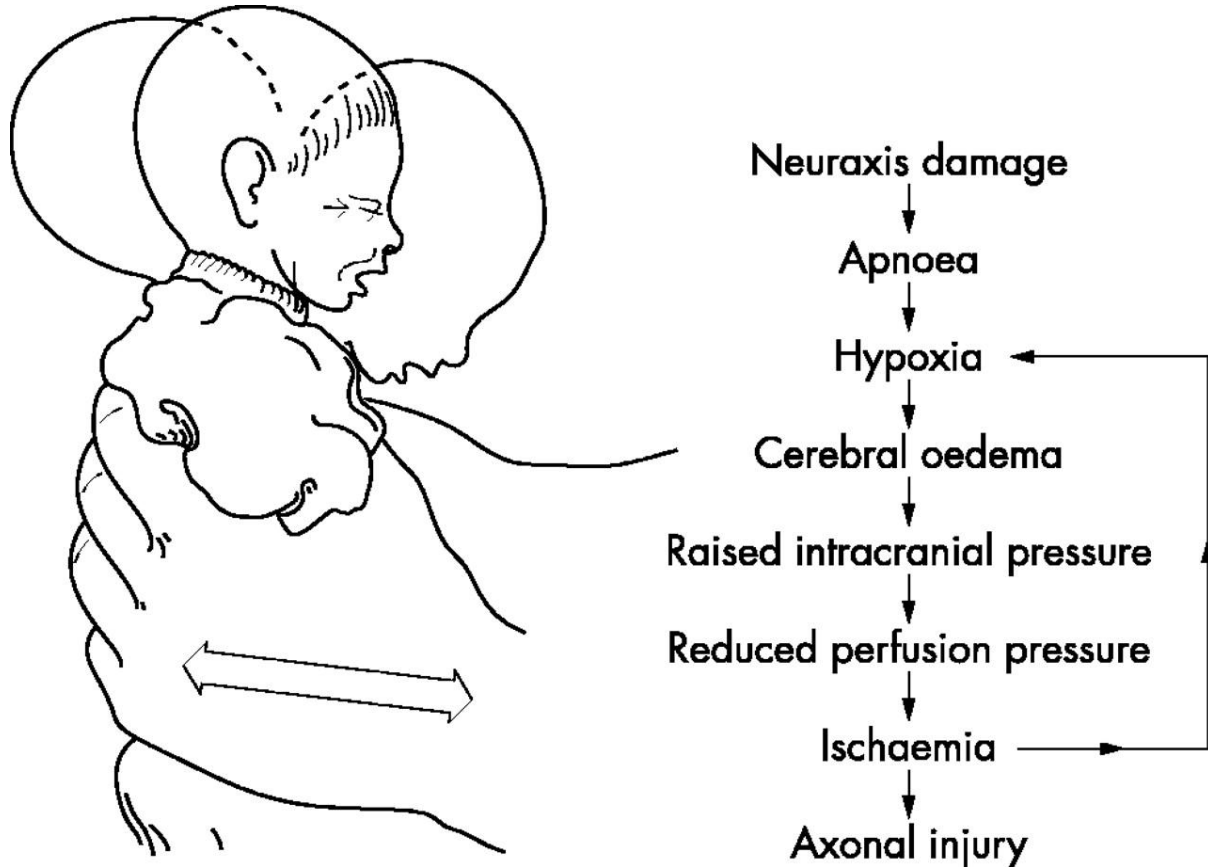
SYNONYMN:¹

The synonym of the shaken baby syndrome include:

- ❖ Abusive head trauma.
- ❖ Shaken impact syndrome.
- ❖ Inflicted head injury.

ETIOLOGY:

- ❖ The infants have very soft neck muscles and they often struggle to keep their head in support with the neck. In case, if the baby was shaken forcefully it makes the brain to move forward and backward inside the skull and may serve as a agent for inducing the formation of bruises, swelling and internal bleeding inside the brain.
- ❖ It occur when the parent or a caretaker shake a baby violently in frustration or anger to prevent the baby from weeping.



COMMON INDIVIDUAL'S INVOLVING IN VIOLENCE:⁴⁻⁶

- ❖ Based on a research, the one who involved in caring the infant on the absence of mother, are the one who generally involved in this type of abusive aggressive behaviour towards the infant in order to stop the child from crying.

✚ The individuals include:

- ❖ Care takers.
- ❖ Baby sitters.
- ❖ Boyfriend.
- ❖ Grand parents.

TIME REQUIRED TO CAUSE INJURY:³

- ❖ The sad part of this syndrome is, it just require as low as 5 seconds to cause injury.

COMMONLY AFFECTED AGE GROUP:

- ❖ Children below 2 years and up to 5 years are the commonly affected group because of this syndrome.

FEATURE:³⁻⁸

The shaken baby syndrome was not caused due to the listed:

- ❖ Bouncing of the children on the knees.
- ❖ Minor falls.
- ❖ Rough play.

IMPACT OF SHAKEN BABY SYNDROME:⁴⁻⁶

- ❖ The shaken baby syndrome destroys the child's glial cells and prevent the utilization of oxygen by the brain and cells.
- ❖ The damage caused by the abusive handling of the children was not reversible because the glial cells does not contain regenerative property.

CLINICAL SIGNS:

- ❖ The mildest are the non-specific and they are not detected.

NON-SPECIFIC SIGNS:

The infant may experience:

- ❖ Shock.
- ❖ Unconscious.
- ❖ Convulsion.

SPECIFIC SIGNS:

The patient may experience:

- ❖ Apnoea.
- ❖ Cyanosis.
- ❖ Hypothermia.
- ❖ Irregular respiration.
- ❖ Intubation ventilation.
- ❖ Opisthotonic with distended fontanel.

SYMPTOMS:⁵⁻⁶

- ❖ The symptoms of physical injury were generally left unnoticed.
- ❖ In some cases, the damage was not seen immediately still the baby will develop health and behavioural problems.
- ❖ The symptoms of shaken baby syndrome was listed below as follows:

GENERAL SYMPTOMS:

- ❖ Extreme irritability.

- ❖ Difficulty in waking up.
- ❖ Loss of appetite.
- ❖ Nausea and vomiting.
- ❖ Pale or blushed skin.
- ❖ Dyspnoea.

SEVERE SYMPTOMS:

It include:

- ❖ Subdural haemorrhage.
- ❖ Spinal cord damage.
- ❖ Paralysis.
- ❖ Coma.
- ❖ Death.

RISK FACTOR:

The risk factor associated with the shaken baby syndrome was listed:

- ❖ A history of mistreated as a child.
- ❖ Young parenthood.
- ❖ Domestic violence.
- ❖ Depression.
- ❖ Frustration.
- ❖ Irritability.
- ❖ Intolerance.

PAIN OF CRY:

- ❖ 90% of the affected infants die.

SURVIVAL RATE OF COMPLICATION:⁷⁻⁹

The 10% survived baby may experience the following:

- ❖ Partial or total blindness.
- ❖ Intellectual disability.
- ❖ Seizure disorder.
- ❖ Cerebral palsy.

ARE THEY PREVENTABLE?

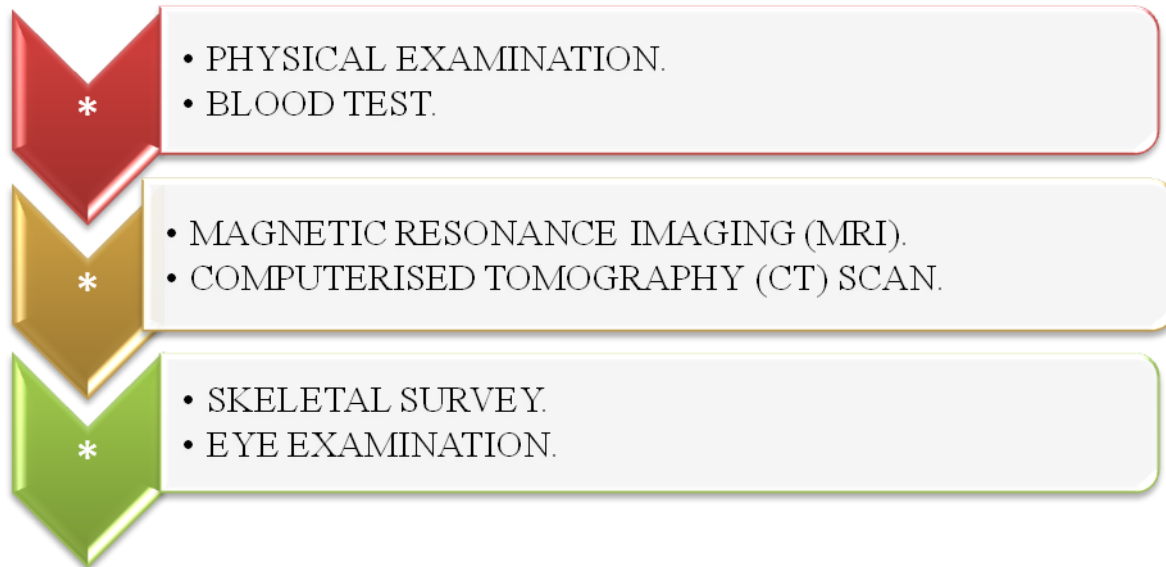
- ❖ Yes they are, the parents and the handlers are educated how to handle a child by a nurse or by an clinical pharmacist.

PREVENTION:⁴⁻⁷

- ❖ Education of the new parents can prevent child abuse.
- ❖ Refer a mental health provider, if you can manage your stress.
- ❖ Treat the child gently.

DIAGNOSIS:⁷⁻⁹

- ❖ The abused baby was examined by different medical specialists, to report the child abuse.
- ❖ On examination, questions will be asked to the parent or to the caretaker regarding the medial history of the infant.
- ❖ Various tests were performed for the conformation of the cause or for determination of the site of injury.

DIAGNOSTIC**TECHNIQUE:****PHYSICAL EXAMINATION:**

- ❖ Here the infants are checked for external injury and oedema.

BLOOD TEST:

- ❖ It was used to rule out some condition like bleeding, blood clots and some metabolic disorder.

MAGNETIC RESONANCE IMAGING(MRI):

- ❖ It uses powerful magnetic wave to obtain detailed images of the child's brain. It was used as a powerful tool of diagnosis. The obtained details includes, bruising, bleeding and signs of decreased oxygen.

- ❖ It was generally performed on the child two or three days after injury.

COMPUTERISED TOMOGRAPHY(CT) SCAN:

- ❖ It was used to provoke cross sectional images of the infants brain.
- ❖ It plays a vital role in determination of the treatment.

SKELETAL SURVEY:

- ❖ Here several X-rays are taken to justify whether the mistreatment was caused accidental or purposeful.
- ❖ It was also used to determine previous fractures.

EYE EXAMINATION:

- ❖ It was done to reveal ophthalmic bleeding and other malfunctions, which may lead to partial and complete loss of sight.

TREATMENT:

- ❖ The affected infant was admitted and monitored in a paediatric intensive care unit. The treatment includes the following:
- ❖ Breathing support was given to reverse the cascade of oxygen depletion.
- ❖ Surgery was performed to stop internal haemorrhage in the brain.

CONCLUSION:

This review will be helpful for educating the current society regarding the unintentional child abuse for a better tomorrow.

REFERENCES:

1. Mian M, et al. Shaken baby syndrome: A review. *Fetal and Pediatric Pathology*, 2015;34:169.
2. Dias MS, et al. Association of a postnatal parent education program for abusive head trauma with subsequent pediatric abusive head trauma hospitalization rates. *JAMA Pediatrics*. 2017;171:223.
3. NINDS shaken baby syndrome information page. National Institute of Neurological Disorders and Stroke. <https://www.ninds.nih.gov/Disorders/All-Disorders/Shaken-Baby-Syndrome-Information-Page>. Accessed Sept. 8, 2017.
4. Shaken baby syndrome. American Association of Neurological Surgeons. <http://www.aans.org/Patient%20Information/Conditions%20and%20Treatments/Shaken%20Baby%20Syndrome.aspx>. Accessed Sept. 8, 2017.

5. Narang SK, et al. Acceptance of shaken baby syndrome and abusive head trauma as medical diagnoses. *Journal of Pediatrics*. 2016;177:273.
6. Christian C, et al. Child abuse: Epidemiology, mechanisms, and types of abusive head trauma in infants and children. <https://www.uptodate.com/contents/search>. Accessed Sept. 8, 2017.
7. Nickels KC (expert opinion). Mayo Clinic, Rochester, Minn. Sept. 21, 2017.
8. Christian CW, et al. The evaluation of suspected child physical abuse. *Pediatrics*. 2015;135:e1337.
9. Paul AR, et al. Non-accidental trauma in pediatric patients: A review of epidemiology, pathophysiology, diagnosis and treatment. *Translational Pediatrics*. 2014;3:195.