



Shaken Baby Syndrome "Review"

KEYWORDS

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ABSTRACT To review the causes, symptoms, treatments, pre-valences, and diagnosis on the shaken baby syndrome.

Objective: To review the causes, symptoms, treatments, pre-valences, and diagnosis on the shaken baby syndrome along with creating the awareness among the community.

Background: Shaken baby syndrome is the most common cause of death of an infant due to the serious neurological injury. This may result from the child abuse, over shaking, natural or accidentally incidents that leads to this syndrome. This syndrome is related to traumatic brain injury as the infants have a very weak neck muscles and large head. Therefore, when they are shaken violently, the fragile brain of the baby tend to bounce back and fourth inside the skull and will result to swelling, bleeding and even lead to severe brain damage and finally lead to death. Thus, it is important to hold their head gently and properly by supporting their head and neck.

Reasons: In India, the percentage of physical abuse is very high especially towards the children and shaken baby syndrome is also one of the form of physical abuse. Thus, this study was review to increase the awareness of shaken baby syndrome.

INTRODUCTION

Shaken Baby Syndrome (SBS) is also known as non-accidental central nervous system (CNS) injury, whiplash-shake syndrome, the shaken infant or it also called as shaken-impact syndrome [1]. Baby with this syndrome will have injury towards their central nervous system, as it is most affected due to this. Generally, this syndrome is happening among the children in the average age less than 2 years old, but it also can be seen in children up to 5 years old [2]. During this period, baby is very fragile and soft. Therefore, they need to be handled very carefully, gently and with lots of love.

From its name, which is shaken baby syndrome, we can identified that this syndrome is related to violently shaking of baby that can results to severe injury. This syndrome can also be considered as a physical abuse toward the children by the parents or guardian either accidentally or with intention to do so. They may not have sufficient knowledge regarding this syndrome, in which they may shake the baby violently and result for a big impact on the baby itself. The parents and guardians should have a thorough knowledge on how to handle or hold the baby properly especially by supporting their neck. This is very important when holding baby under the age of one years old.

Baby whom having shaken baby syndrome, have high probability for experiencing few signs like altered level of consciousness in an infant or toddler, brain swelling [1] and the worse part of it, there is also tendency for the baby to die, which is very high. Normally, shaken baby syndrome can be detect and diagnosed by depending on the triad of subdural hemorrhage (SDH), retinal haemorrhage and encephalopathy [3]. Although, the baby may have all the three components, there is tendency and chances for the baby to survive and stay a life.

HISTORY

In the early of 70s, Guthkelch [4] and then John Caffey [5] have proposed the whiplash shaken baby syndrome.

Guthkelch stated that not all babies will having external mark on their head due to subdural haemorrhage [3], instead the babies may appear just like a healthy baby. However, due to the shaking of the baby, there will be bridging of veins formed that result to this haemorrhage. Caffey also proposed almost a similar things regarding this, in which he stated that there may be either a little or no presence of the evidence of the external cranial trauma [2] due to the triad.

Their researched on this was then followed by Duhaime in late 80s, in which she had done a researched on patients involve in this syndrome. She found out that among the 57 patients, most of them having evidence on cranial trauma, skull fractures, bruises as well as contusion and laceration. From this, she concluded the shaken produce a greater acceleration force that lead to this impact [3].

In 1943, Holbourn had proposed a correct explanation about the rotational forces mentioned by the Guthkelch, on the mechanisms of intracranial injury. He stated that rotations are of paramount importance [6]. Thus, if the head is located well at the exact placed, there will be no chances for it to have rotational injury due to excessive forces of impact. Therefore, his statement help people to understand better, on the chances for the baby to have the rotational injury. In this range of age, baby or children neck region and above is not well developed compare to adult. Thus, if excessive forces is given to them, there is potential for them to have rotational injury due the hinge of head on the neck. Due to this, they are more vulnerable toward this compare to adult, whom the bone and musculature are well developed.

This review will help readers to understand better about baby shaken syndrome more deep about its causes, symptoms and also treatments for this.

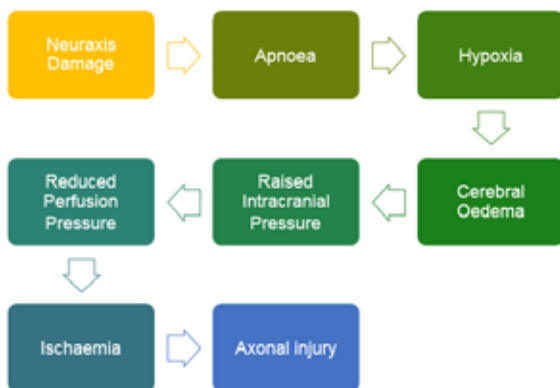
Causes of Shaken Baby Syndrome

Generally, baby with the shaking injury may have clinical,

radiological of pathological evidence of impact [7]. Usually, shaken baby syndrome is occur due to the vigorously shaken of the baby by the parents or caretaker. The baby have weak muscle of neck which is very fragile. This muscle will help the baby to support their big and heavy head. When the baby is shaken violently, the fragile brain of the baby move back and forth within the skull [8]. The neck that supporting the brain also tend to fracture. This will result to bruising, swelling and bleeding. However, in some conditions the outcome from this actions is not properly displayed by the baby. The baby may experience a mild symptoms which is not accurately showed.

Although forcefully shaking of the baby is the major cause for this syndrome, this alone does not explain the exact reason for this to happen. Beside, this syndrome is also related to hypoxia. There is difference between hypoxia and brain injury trauma. When there is violent and vigorously shaking of an infant, it will initiate the hypoxia which then in turn lead to cranial injury [9]. This will followed by the oedema which result to increase in the intracranial pressure [10]. The worse impact from this would be either neurological damage or death of the baby causes by drop of pressure of the cerebral perfusion in relation to ischaemia [7]. Hence, this lead to axonal injury or traumatically brain injury.

This consequences can be easily understand through the chart below [7].e



Clinical Features

The clinical features of shaken baby syndrome may vary based upon the conditions of the baby itself. The sign may seen from mild and non-specific to severe, and this is clinically called as head trauma [2,11]. The immediate symptoms that can be seen within days or weeks are poor feeding, lethargy, vomiting and irritability [2]. However, this symptoms may be misinterpreted by the parents, because it almost similar to symptoms of cold and fever. Therefore, it is necessary to take the baby for check up, if the signs prolonged for a long time.

In addition, if the baby remain unconscious after being shaken, he shows the sudden response towards the shaken. In this conditions, the baby need to be refer to physicians immediately. This traumatic impact may already alter the consciousness of the baby, reduce the capability neither to suck nor swallow and also the movements of eye, smile or talk [2]. However, if medical treatment given to the baby is late, this will prevent the early therapeutic intervention by the physicians.

The other clinical sign may be involve in difficulty of

breathing of the baby that can lead to bradycardia [2, 12,13], as well as other injuries like rib fractures, abdominal injuries, bruises and etc. The features also may become more severe and unnoticeable. Example for this are eye injuries and skeletal injuries.

Eye injuries is rarely occur and it is related to retinal haemorrhage, which can be either unilateral or bilateral which can only be confirmed through diagnosis [13,14]. It may occur due to increase in central retinal vein due to increased in intracranial or intrathoracic pressure [7]. Next, skeletal injuries is in consequence with fractures of bone. For example, fractures of posterior rib that causes squeezing of chest due to firmly grip on the baby.

In addition, subdural or subarachnoid hematomas which is also known as intracranial bleeding is also associated with the shaken baby syndrome. The bleeding usually occur due to the shearing of blood vessels in between the brain and dura mater

Test and Diagnosis

Shaken baby syndrome in certain circumstances is hard to define and recognise. Even the cause for this cannot determined either it is due to shaken, accidents or disease. The only way we can distinguished is through radiology. Both CT scan and the MRI can be used to detect and diagnosis the subdural hematomas. Chronic subdural hematomas tend to develop from a small amounts of venous blood and become enlarge in the subdural space [7]. Therefore, to prevent this conditions from becoming more severe, early diagnosis can be done through CT or MRI.

1. Computed Tomography (CT)

CT scan will help to imaging the injured brain of the baby that will be used for further diagnosis and evaluation. It is used to visualise the subarachnoid haemorrhage, mass effect as well as large extra-axial haemorrhage in the brain [2, 15]. It should be taken for several time for accurate result or if the neurologic image rapidly changes [2].

2. Magnetic Resonance Imaging (MRI)

MRI can also be used for assessing the traumatical brain injury. It is similar to CT, but it is much better than it. It able to detect and define the intraparenchymal lesions [15] in brain as well as subdural haemorrhage.

Prevention

Precaution step must be taken in order to prevent the this syndrome from becoming more prevalences. For the fact that baby frequently crying is normal in their age. This show that they are having a normal developmental behaviour [16]. The parents and the caretakers should understand about it and know how to manage and give responds toward them. Although it will be hard for the parents and caretakers to understand the exact reasons for them to crying, the way they responds to them will help them to figure out the exact causes.

Hospital based for parents education programme is also important to help in giving early education to parents regarding the shaken baby syndrome [17]. This programme is specially meaningful for parents of new inborn baby. Through this, parents will have the clear picture on how this syndrome can occur and how to take precautions step to prevent it from happen. If accidentally, the baby happen to be shaken violently, the parents will have idea about the clinical signs as well as they can take a crucial step by bringing their precious children to hospital for further check up.

Therefore, this precaution steps can help to reduce the incidents of head injuries toward the babies, and prevent them from having abusive head trauma.

Conclusion

Shaken baby syndrome is initiated by the violently shaken of baby. This may result the baby to have few symptoms like difficulty of breathing, vomiting, unconscious and unresponsive. The features may become more severe as the baby could have retinal haemorrhage as well as subdural haemorrhage that could lead to death. Therefore, the baby must be taken to the hospital as fast as possible for further diagnosis and evaluation.

This review was done with the aim to help people to understand better about the shaken baby syndrome. This is because the incidents, are commonly happen among the parents and the caretakers almost in all countries. The outcome from the injuries not only give impact to the baby, but also toward their parents. The parents may also be charged for abusive the baby, because they are causing damage to them. Hence, it is important for everybody to handle their baby carefully and also to control their emotions when handling them.

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