STUDY OF INCIDENCE OF HEAD INJURIES WITH REFERENCE TO SUBDURAL HAEMORRHAGE

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ABSTRACT

BACKGROUND

The objective of this study was to evaluate the incidence of subdural haemorrhage among males and females. An autopsy study of subdural haemorrhage in head injuries was done. Subdural haemorrhage is a common manifestation in trauma in vehicular accidents, head injuries due to blunt force, being hit by a moving object etc., Subdural haemorrhages are more common in children and old people. It is more common in males than females.

MATERIALS AND METHODS

The present study has been carried out in the Department of Forensic medicine, Government Medical College, Ananthapuramu, Andhra Pradesh; in the period between January 2015 to December 2017 and data that is collected from Dept. of Forensic Medicine, S.V.S. Medical college, Mahaboobnagar, Telangana in the period between June 2015 to December 2017 in 64 cases containing cases of falls, vehicular accidents, blunt injuries to head. Data was collected from the police, relatives, and photographic evidences from the scene, post-mortem findings.

RESULTS

64 cases of subdural haemorrhages are studied. Around 50 cases (78.125%) are males and remaining 14 (21.875%) are females. Subdural haemorrhage is around 3 times more common in males than females.

CONCLUSION

Subdural haemorrhages are more common in vehicular accidents involving head injuries and is more common in males than females.

KEYWORDS

Subdural Haemorrhage, Blunt Injuries, Vehicular Accidents, Falls, Minor Accidents, Males, Females.

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BACKGROUND

Among all the regional injuries, the injuries to head and neck are the most common and important in Forensic practice. Deaths from head injury comprise 1-2% of all deaths from all causes and one third to one half of all deaths due to trauma are due to head injury. Of the survivors, those with a head injury were substantially more impaired than those without the-former, therefore-also being an important cause of morbidity. In total deaths occurred due to head injuries, Road traffic accidents are the main causes for nearly two third of cases. Any Trauma to head or face that has the potential for damaging the brain can have devastating consequences. Normally the brain is protected within the bony skull, but it is not well restrained within this compartment and injuries to the brain result from differences between the motion of the solid skull and the relatively 'fluid' brain. Intracranial haemorrhage means haemorrhage within cranial cavity. Fracture of skull bones though is the common cause of intracranial haemorrhage, the haemorrhage can occur even without fracture of any skull bone, or in absence of any injury to the brain, but due to disease process or effects of trauma on existing diseased area of the brain. A detailed history of past illness, and detailed autopsy may be the answer to various questions that often arise in case of death from head injuries. Haemorrhage resulting directly from trauma usually occurs over the surface of the brain, but deep-seated haemorrhage can also occur in the cerebrum, cerebellum or brain stem, due to trauma. The intracranial haemorrhage is usually with contusions or lacerations of the brain as coup or countercoup injuries. In an arteriosclerotic and hypertensive subject, emotional excitement or physical exertion may precipitate intracerebral haemorrhage; if such a person falls down with scalp injury, the haemorrhage may appear to be traumatic in origin. The clinical significance of any space occupying lesion within the cranial cavity is the effect that the raised intracranial pressure caused has on brain structure and brain function. Blood that is collected in the cranial cavity compresses the brain and, if it continues for sufficient time, and in sufficient quantity, can raise the intracranial pressure

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and blood flow to the brain decreases and, if the pressure reaches the point where it equals or exceeds arterial blood pressure, the blood flow to the brain will cease. The Dura is strong and bluish connective tissue membrane and is firmly attached to the skull. A subdural hematoma (SDH), is a type of hematoma, usually associated with traumatic brain injury. Blood gathers between the inner layer of the dura mater and the arachnoid mater. Subdural haemorrhage most commonly occurs due to rupture of bridging veins which passes through subdural space resulting in the increase of intracranial pressure which leads to compression and herniation of brain tissue.[1] Subdural haemorrhage is caused due to trauma and spontaneous causes.[2] Factors which increase the risk for subdural haemorrhage most commonly include very young age children or very old age people. As so many researchers conclude that volume of brain shrinks with the age of a person. Advances, the space between dura mater and arachnoid membrane, which is called subdural space, enlarges. So, the veins that traverse that space have to pass through longer distances and they get vulnerable for tears. Subdural haemorrhage is a common manifestation in head injuries due to blunt trauma due to falls, blow with blunt weapon, traffic injuries, crushing of the head etc., Gliding movement between the dura and arachnoid mater leads to overstretching and tearing of communicating veins traversing in subdural space.[3] As the subdural space has no mesothelial lining, haemorrhage cannot get resolved and such hematoma is found only at autopsy. Post-mortem analysis has indicated that those caused by arterial rupture are usually temporoparietal whereas bridging veins rupture is typically in the frontoparietal and parasagittal regions. Acute SDH occurs with injury where there are high rates of angular accelerations and decelerations, as in a fall or assault, which lead to rupture of the bridging veins. SDH can also arise as a result of whiplash injury including the consequence of blast injury. A number of underlying conditions may predispose to acute SDH. These include underlying brain atrophy, including alcohol induced brain degeneration changes such as brain atrophy, as well as underling coagulopathies including anticoagulant therapy injury. Other conditions may be associated with spontaneous EDH, including AV malformations, neoplastic lesions and following rupture of an intracranial aneurysm. Traumatic sub dural bleeds are often acute that means the bleeding starts immediately and the symptoms appear immediately. Whereas in atraumatic causes such as coagulopathies, AV malformations etc., the bleeding is for longer duration and the symptoms appear slowly and progressively increases. Based on duration of bleeding and its appearance on CT scans, SDH can be classified into 1) Acute SDH: These are less than 3 days old and appear hyperdense, when compared with the brain tissue, on the CT scan. 2) The subacute phase begins 3-7 days after acute injury. 3) Chronic subdural hematomas develop over the course of weeks and are hypodense compared with the brain. In some cases, the bleeding may occur freshly in the already formed old haematoma which is called as Acute on chronic SDH. SDH is manifested clinically according to the following symptoms: 1) Acute-only diagnosed at autopsy. 2)Subacute: here the symptoms manifest after 2-14 days. 3)Chronic type: symptoms are further delayed. Symptoms include sudden tingling, weakness, numbness, paralysis, severe headache, difficulty with swallowing or vision, loss of balance or coordination, difficulty understanding, speaking, reading, or writing, and a change in level of consciousness or alertness, marked by stupor, lethargy, sleepiness, or coma. On autopsy, in acute cases, clotted blood is present in the subdural space and it cannot be washed out. In chronic cases, a blood cyst may be noticed.

MATERIALS AND METHODS

The present study has been carried out in the Department of Forensic medicine, Government medical college, Ananthapuramu, Andhra Pradesh in the period between January 2015 to December 2017 and data that is collected from Dept. of Forensic medicine, S.V.S. Medical college, Mahaboob Nagar, Telangana in the period between June 2015 to December 2017 on 64 cases containing cases of falls, vehicular accidents, blunt injuries to head. Data were collected from the police, relatives, and photographic evidences from the scene, post-mortem findings.

Inclusion Criteria- Head injuries cases with Subdural Haemorrhage.

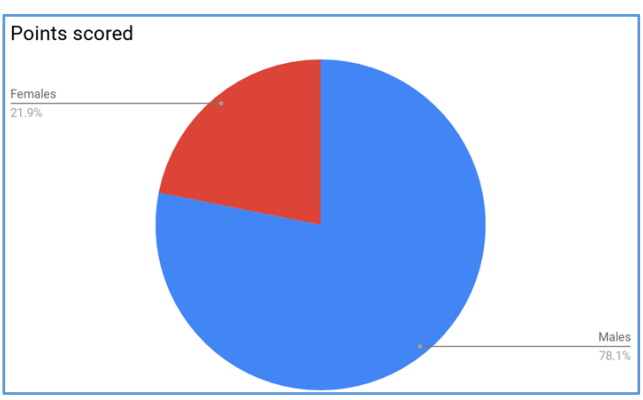
Exclusion Criteria- Head injuries cases with other types of intracranial haemorrhages.

RESULTS

64 cases of subdural haemorrhages are studied. Around 50 cases (78.125%) are males and remaining 14 (21.875%) are females. That is, Subdural haemorrhage is more common in males than females in a ratio of 3:1.

Gender	No. of Cases with Subdural Haemorrhage	Percentage
Males	50	78.125%
Females	14	21.875%
Total	64	100%

Table 1. Showing Proportion of Various Types of Cases with Subdural Haemorrhage



Pie-Chart 1. Proportion of Cases with Subdural Haemorrhage in Males and Females

DISCUSSION

Subdural Haematoma occurs due to rupture of bridging veins that pass through the subdural space. The rupture of veins occurs due to the tension created in their weak walls (as compared to arteries) by external trauma. Subdural haematoma results in more pressure over the surface of the brain [4] and also some substances are released when there is an injury which leads to further vasoconstriction which results in decreased blood supply to brain and leads to ischemia of brain.[5] As all other organs, when the blood flow to brain is decreased, the brain cells suffers from lack of nutrition and also decreased disposal of wastes generated by cells which leads to brain cell death.[6] This condition lead to higher risk of death for the patient. Subdural haematoma occurs in patients with less severe head injuries also, particularly those who are elderly or who are receiving anticoagulants. It may be spontaneous rupture of fragile blood vessels or bleeding or due to procedures done for laboratory diagnosis such as lumbar puncture. Even with the best neurosurgical and medical care, the success of the treatment cannot be guaranteed, and rates of mortality and morbidity can be high. Subdural haematoma is classified based on the size, location (parietal or temporal, frontoparietal etc.,) duration (Acute, sub-acute, chronic) since the bleeding started. The appearance of haematoma on computed tomography scan (CT Scan) determines the duration of bleeding, if the inciting event is not known. Overall the prognosis of the patient is not generalised but, it depends on the medical and neurologic conditions of the patient. These same factors also determine the treatment course and also determines the outcome of the treatment. Based on duration of bleeding and its appearance on CT scans.

Aetiology of subdural haematomas differs according to the age of the person:[4,5] in infants: non-accidental injury such as excessive shaking (shaken baby syndrome), in young adults: motor vehicle accidents are the most common, in elderly: accidental falls. They are present in 10-20% of all head trauma cases and occur in up to 30% of fatal injuries.[7,8] The incidence of subdural hematomas varies according to gender of the patient also with a male-to-female ratio of approximately 3:1.[9] In the study conducted by Shimoji et al (1992),[10] total cases studied were 112. Out of which males were 87 and females were 25. Male/Female ratio was 3.48. Male to female ratio in the study conducted by Pu et al (1999)[11] was 30.67, which is maximum of all the studies and the no. of cases studied were 95. Out of which males were 92 and females were only 3. Study conducted by Pukuri et al (1993)[12] in a total of 76 patients, out of which, males were 50 and females were 26, the Male/Female ratio was 1.92. A less recent study conducted by Isobe et al (2008)[13] concluded that male to female ratio was 2.72 evaluated from the total cases studied which were 535. Among them males were 391 and females were 144. In the study conducted by Ko et al (2008),[14] no. of cases studied were 255. Out of which males were 150 and females were 55. Male/Female ratio was 2.73. Along with this fact, the old aged people have age associated blood vessel changes that makes the vessels more brittle than the younger aged people and hence they are more vulnerable for bleeds. As the elderly have more brittle veins chronic subdural bleeds more common in them.[15] Infants, also, have larger subdural spaces like old aged people and are more predisposed to subdural bleeds than are young adults.[16] Mostly affected are men rather than females. Brain injuries are more common in males than females in a ratio of 3:1.[17] Even though the brain injuries are more common in males as they have greater exposure to head injuries,[18,19] It could not be enough to explain the predominance of Subdural haemorrhage in males. Brain injuries are more common in males than females in a ratio of 3:1.[17] Mean brain size, by weight or volume, of men is more than females by 9-12% is very well known by imaging studies.[20] Some brain regions undergo volume decline as age advances and those changes are more common in men than females and there is an evidence for it (Gur RC et al).[21]

CONCLUSION

Subdural haemorrhage is more common in males than in females. There are many explanations for this difference. Some of the reasons are more exposure to accidents in males as compared to females. But, others also exist such as more brain atrophic changes in males, greater size of brain volume in males. Also, the dimensions of cranium have significant effects on the incidence of subdural haemorrhage in males.

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