



ISSN: 2321-8819 (Online) 2348-7186 (Print) Impact Factor: 1.498 Vol. 7, Issue 2, February, 2019

Evaluation of Etiological Factors of Subarachnoid Hemorrhage (SAH) Using CT scan as the Gold Standard.

Tuba Rashid¹, Muhammad Ahmad² and Muhammad Zeeshan³

¹Women Medical Officer, District Headquarters DHQ Okara,

Email: lyzeofkiel9770311@gmail.com

Ph. # 0307-6679973

²Medical Officer, Data darbar hospital Lahore,

Email: mahmed0098@gmail.com Ph. # 0334-0167799

³Medical Officer RHC 740GB Kamalia

Email: zeeke051@gmail.com

Ph. # 03135152662

ABSTRACT:

Objective: This study was focused to find out the precision of the CT scan in diagnosis of the subarachnoid hemorrhage.

Study Design: Prospective type of study.

Duration and Setting: This study was carried out in a period of 9 months from August 2017 to April 2018 in Mayo hospital Lahore in Neurosurgery department.

Patients and Methods: Off all the cases landing in Mayo hospital emergency department only those cases were selected which had subarachnoid hemorrhage and in this study only those were included which had hemorrhage due to some sort of trauma or vascular injury. A total of 100 patients were selected in a period of 9 months which were willing to take part in this research. Informed consent was taken from the patient or attendant. A carefully designed proforma was used for data collection. Ethical approval was taken from the ethical committee of the Mayo hospital.

Results: A total of 1538 cases presented in emergency in 9 months with subarachnoid hemorrhage and 100 cases were selected which were willing to take part in study. Clinical feature were recorded. Total 66 (66%) cases had throbbing headache (a typical feature of subarachnoid hemorrhage), nausea and vomiting was recorded in 53(53%) cases while stiffness of neck was seen in 26(26%) cases. Head injury was the leading cause with 53(53%) in these patients, ruptured aneurysm was noted in 30(30%) of the cases and 12(12%) hemorrhages were because of the arterio-venous malformation. Typical findings of SAH were seen in 97(97%) of the cases on CT scan and atypical findings were seen in 3(3%) of the cases of SAH.

Conclusion: Trauma was the leading cause of SAH while arterio-venous malformation and other causes like aneurysmal rupture were seen in some cases. Headache was the most commonly found clinical feature.

Key Words: Subarachnoid Hemorrhage, Headache, CT scan,

Introduction: Subarachnoid hemorrhage is referred to as the accumulation of blood in the subarachnoid space. ^[1] Blood is not present within the substance of the brain, instead it is found in a complex vascular system within the brain. SAH is

an extreme emergency and it should be dealt immediately. Severe throbbing headache is seen in these patients along with stiffness of the neck, nausea and vomiting and in some instances photophobia. ^[2,3] It is an acute medical emergency with high morbidity and mortality. ^[4] People of any age group can have a traumatic rupture of the blood vessels leading to SAH but as the person ages the blood vessels integrity becomes low and hence the chance of SAH due to rupture of blood vessels is more common in old age. Horner syndrome due to Oculomotor nerve palsy or other deficits of sensory or motor systems may be seen depending upon the area involved. Neck stiffness or severe pain radiating down the back upon flexion of the neck may be seen in some cases. Posterior communicating artery, bifurcation of the basilar artery, cerebellar artery and communicating arteries aneurysms are associated with SAH. ^[5] Head injury was the commonest cause in our study with incidence of 53%. Second common cause was rupture of the aneurysm 30% followed by AVM incidence of 12%. SAH is classified in four grades. Neck stiffness and slight headache is classified as grade-1. ^[6] Motor or sensory deficiency along with severe throbbing headache and stiffness of the neck is present in grade-2. Focal neurological deficit, giddiness, confusion, hemiparesis and decerebrate rigidity is present in grade-3. Deep coma and decerebrate rigidity is present in grade-4. CSF sampling done via lumbar puncture and its examination was used for the diagnosis of grade-4 SAH before CT scan. ^[7] CT scan being a non-invasive procedure has become very useful in diagnosis.

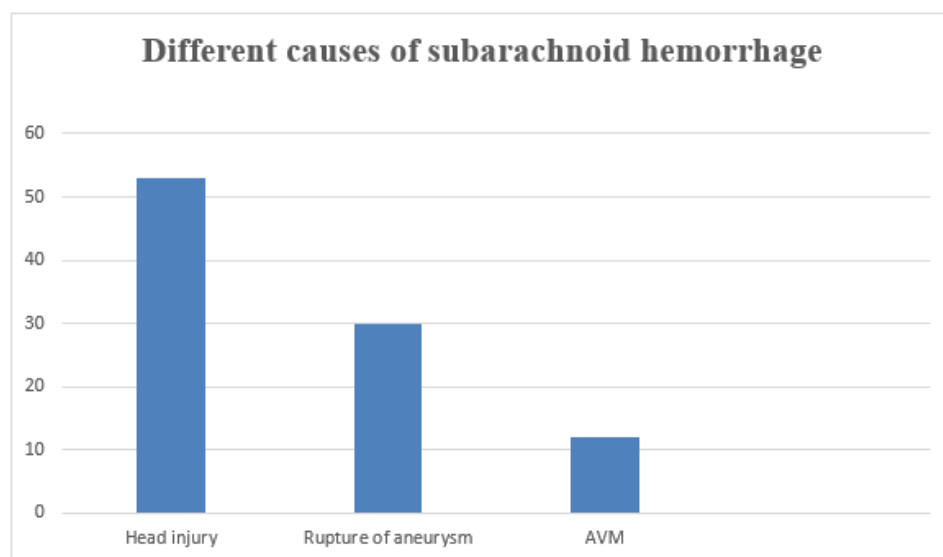
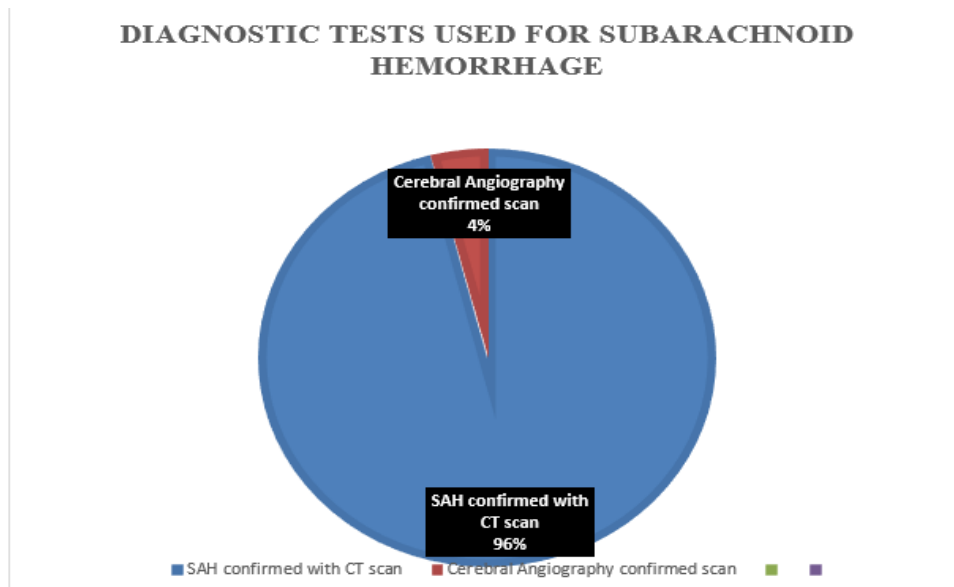
Material and Methods: Off all the cases landing in Mayo hospital emergency department only those cases were selected which had subarachnoid hemorrhage and in this study only those were included which had hemorrhage due to some sort of trauma or vascular injury. A total of 100 patients were selected in a period of 9 months which were willing to take part in this research. Informed



consent was taken from the patient or attendant. A carefully designed proforma was used for data collection. Ethical approval was taken from the ethical committee of the Mayo hospital. In all these patients CT scan of the brain was done at their initial presentation and then repeated 48 hours later for further observation of the disease. High frequency CT scan was done and 5mm slices were taken. Careful monitoring was done and the patients were admitted in the neurosurgery ward. Microsoft office 2013 was used for data analysis and then recorded in the form of tables and charts.

Results: A total of 1538 cases presented in emergency in 9 months with subarachnoid hemorrhage and 100 cases were selected which

were willing to take part in study. Clinical feature were recorded. Total 66 (66%) cases had throbbing headache (a typical feature of subarachnoid hemorrhage), nausea and vomiting was recorded in 53(53%) cases while stiffness of neck was seen in 26(26%) cases. Head injury was the leading cause with 53(53%) in these patients, ruptured aneurysm was noted in 30(30%) of the cases and 12(12%) hemorrhages were because of the arterio-venous malformation. Typical findings of SAH were seen in 97(97%) of the cases on CT scan and atypical findings were seen in 3(3%) of the cases of SAH and in these patients cerebral angiography was done for the diagnosis.



**Frequency of signs and symptoms of SAH at the time of presentation**

Signs/symptoms	Number of patients	Frequency (%)
Headache	66	66%
Nausea or vomiting	53	53%
Neck stiffness	26	26%

Discussion: Structure of the blood vessels in the brain matter is very different from the blood vessels present in all other body structures. These vessels are weak and delicate and tunica media contains only few smooth muscles. SAH has higher incidence in older age partly because these vessels become weak with age and are more prone to rupture and partly because in subarachnoid space only little support is present for the large vessels and hence they are ruptured easily due to trauma. Initially lumbar puncture was used for the diagnosis of SAH but now CT scan being a noninvasive procedure has replaced lumbar puncture. In this study CT scan confirmed the diagnosis in 96% of the cases. Related results have been shown by Hassaler et al [8], Hourihane et al [9] and Leblanc et al [10]. In this study patients had severe throbbing headache. Related findings were shown by Leblanc, Richman and Lindsay et al in other studies. [11,12,13] High morbidity and mortality

of the SAH was studied by Lindsay. Sensory or motor deficits may be seen in the patients with SAH. In SAH the pressure in the brain is increased due to accumulation of blood and this compresses nearby structures which mostly includes third cranial nerve leading to its palsy. Further deep coma may be seen. SAH is classified in four grades. [13,14,15] Neck stiffness and slight headache is classified as grade-1. [6] Motor or sensory deficiency along with severe throbbing headache and stiffness of the neck is present in grade-2. Focal neurological deficit, giddiness, confusion, hemi paresis and decerebrate rigidity is present in grade-3. Deep coma and decerebrate rigidity is present in grade-4. CSF sampling done via lumbar puncture and its examination was used for the diagnosis of grade-4 SAH before CT scan. [7] CT scan being a non-invasive procedure has become very useful in diagnosis. Death rate increases with the progression of the disease hence early diagnosis and prompt treatment is needed. Progression into the deep coma mostly leads to the death and surgical intervention may be needed in complicated cases.

Conclusion: SAH is an acute emergency situation and a very dangerous disease that leads to multiple disabilities and even death. Trauma is the leading cause of SAH while arterio-venous malformation and other causes like aneurysmal rupture are seen in some cases. Headache is the most commonly found clinical feature. CT scan of the brain is gold standard in diagnosis and after localization of the hemorrhage cerebral angiography is done.

REFERENCES:

1. Adam H.P., Jergenson, D. D ., and Sahs, A. L: Pitfalls in the recognition of Subarachnoid hemorrhage. J.A.M .A., 1980:244:794-796.
2. Beguelin, C., and Seller, R: Subarachnoid hemorrhage with normal cerebral panagigraphy. Neurosurgery, 1952; 13:443-450.
3. Bjorkesten, G., and Troupp, H: Prognosis of Subarachnoid hemorrhage. A comparison between patients with verified aneurysms and patients with normal angiograms. J. Neurosurg., 1975; 14:434-441.
4. Duboulay, G.H., and Gado, M: The protective value of spasm after Subarachnoid hemorrhage. Brain 97: 1974; 153-156.
5. Hamby, W .B: Spontaneous Subarachnoid hemorrhage of aneurysmal origin. J.A.M .A., 1948; 136: 522-528.
6. Hamby, W .B: Spontaneous Subarachnoid hemorrhage of aneurysmal origin. J.A.M .A, 1948: 136: 522-528.
7. Hassaler, O: Morphological studies on the large cerebral arteries (with reference to the aetiology of Subarachnoid hemorrhage) Acta Psychiatry Scand. Suppl., 1961; 36:26-58.
8. Hochberg, H.H., Fisher, G.M. and Roberson, G.H: Subarachnoid hemorrhage caused by rupture of a small superficial artery. Neurology (Minneapolis), 1974; 24:319-321.
9. Hourihane, M .D., Gates, P.C., and McAllister, VI: Subarachnoid hemorrhage in childhood and adolescence. J. Neurosurg., 1984; 60:1163-1166.
10. Leblanc, R: The minor leak preceding Subarachnoid hemorrhage. J. Neursurg.. 1987; 66: 35-39.



11. Leblanc, R., and Winfield, J.A: The warning leak in Subarachnoid hemorrhage and the importance of its early diagnosis. *Can. Med.Assoc, J.I.* 1984; 131: 1235-1236.
12. Lofgren, L.E., Rachman, L, and Castle, W .M: Spontaneous primary Subarachnoid hemorrhage in Rhodesian Africans *fr.J.Med. Sci.*, 1973;4:77-86.
13. Lindsay, K.W ., Teasdale, G.M ., Knill-Jones, R.P., and Murray, L: Observer variability in grading patients with Subarachnoid hemorrhage. *J. Neurosurg*, 1982; 56:628-633.
14. Lindsay, K.W ., Teasdale, G.M ., Knill-Jones, R.P., and Murray, L: Assessment of the consequences of Subarachnoid hemorrhage. *Acta Neurochir.*, 1982; 63: 59-64.
15. Nibbelink, D .W ., Torner, J., and Henderson. W .G: Intracranial aneurysms and Subarachnoid hemorrhage. *Stroke*, 1977; 8:202-218.