**Clinical correlation between the amount of spontaneous subarachnoid hemorrhage and the patient need for ventriculo- peritoneal shunt**

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**Abstract**

Objective: clinical assessment between degree of subarachnoid bleeding and patients need for ventriculo-peritoneal shunts.

Patients and methods: thirty cases were involved in this study,, from may 2010 to may 2011 at kasr el aini emergency department, All cases had full examination as regard history,clinical examination,CT on admission , CT F/U every 48hrs for 2 weeks ,1 m and 3 m after the attack, CT angiography or 4 vessels angiography .

Results: 4 cases had Gr. II bleeding,14 cases had Gr. III and 12 cases had Gr.

IV. Sixteen cases had V-P shunt and 14 cases had no V-P shunt.

Conclusion: We did not experience a big difference between cases with high grade bleeding that need shunt and cases that need no shunt , only 4 cases (15.4%) is the difference between the two groups and may be there are other factors that may affect the patients with subarachnoid hemorrhage to have v-p shunts for hydrocephalus .such as vasospasm and the patients neurological status.

**Key words**: subarachnoid hemorrhage, fisher grade,ventriculo-peritoneal shunt

**INTRODUCTION:**

A subarachnoid hemorrhage is [bleeding](http://en.wikipedia.org/wiki/Bleeding) into the [subarachnoid space](http://en.wikipedia.org/wiki/Subarachnoid_space) ,the area between the [arachnoid membrane](http://en.wikipedia.org/wiki/Arachnoid_(brain)) and the [pia mater](http://en.wikipedia.org/wiki/Pia_mater) surrounding the [brain](http://en.wikipedia.org/wiki/Human_brain).

[Symptoms](http://en.wikipedia.org/wiki/Symptom) of SAH include a severe symptoms of SAH include severe [headache](http://en.wikipedia.org/wiki/Headache) with a rapid onset ("[thunderclap headache](http://en.wikipedia.org/wiki/Thunderclap_headache)"), [vomiting](http://en.wikipedia.org/wiki/Vomiting), confusion or a lowered [level of consciousness](http://en.wikipedia.org/wiki/Level_of_consciousness), and sometimes [seizures](http://en.wikipedia.org/wiki/Seizure)1

SAH is a form of [stroke](http://en.wikipedia.org/wiki/Stroke) and comprises 1–7% of all strokes.2 It is a [medical emergency](http://en.wikipedia.org/wiki/Medical_emergency) and can lead to death or severe [disability](http://en.wikipedia.org/wiki/Disability). Up to half of all cases of SAH are fatal and 10–15% die before reaching a hospital, and those who

This may occur spontaneously, usually from a ruptured [cerebral aneurysm](http://en.wikipedia.org/wiki/Cerebral_aneurysm), or may result from head injury ,[problems with blood clotting](http://en.wikipedia.org/wiki/Coagulopathy) and [pituitary apoplexy](http://en.wikipedia.org/wiki/Pituitary_apoplexy) can also result in SAH.6

survive often have neurological or cognitive impairment3

As a result of the bleeding, the body releases large amounts of [adrenaline](http://en.wikipedia.org/wiki/Adrenaline). This leads to a sharp increase in the [blood pressure](http://en.wikipedia.org/wiki/Blood_pressure); the heart comes under substantial strain, and [neurogenic](http://en.wikipedia.org/wiki/Neurogenic) [pulmonary edema](http://en.wikipedia.org/wiki/Pulmonary_edema) .[cardiac arrhythmias](http://en.wikipedia.org/wiki/Cardiac_arrhythmia)4-5

## CAUSES:

In 85% of cases of spontaneous SAH, the cause is rupture of a cerebral aneurysm.1 In 15–20% of cases of spontaneous SAH, no aneurysm is detected on the first [angiogram](http://en.wikipedia.org/wiki/Angiogram).6 About half of these are attributed to non- Aneurismal perimesencephalic hemorrhage1 .The remainder are due to other disorders affecting the blood vessels (such as [arteriovenous malformations](http://en.wikipedia.org/wiki/Cerebral_arteriovenous_malformation)), disorders of the blood vessels in the [spinal cord](http://en.wikipedia.org/wiki/Spinal_cord), and bleeding into various [tumors](http://en.wikipedia.org/wiki/Tumor).1 [Cocaine](http://en.wikipedia.org/wiki/Cocaine) abuse and [sickle cell anemia](http://en.wikipedia.org/wiki/Sickle_cell_anemia) (usually in children) and, rarely, [anticoagulant](http://en.wikipedia.org/wiki/Anticoagulant) therapy,

**DIAGNOSIS:**

The modality of choice is [computed tomography](http://en.wikipedia.org/wiki/Computed_tomography) (CT scan) of the brain. [Magnetic resonance imaging](http://en.wikipedia.org/wiki/Magnetic_resonance_imaging) (MRI) may be more sensitive than CT after several days.1

After a subarachnoid hemorrhage is confirmed, its origin needs to be determined, the choice is between [cerebral angiography](http://en.wikipedia.org/wiki/Cerebral_angiography) and [CT angiography](http://en.wikipedia.org/wiki/Computed_tomography_angiography) 1,3

The Fisher Grade classifies the appearance of subarachnoid hemorrhage on CT scan.This scale has been modified by Claassen and coworkers, reflecting the additive risk from SAH size and accompanying [intraventricular hemorrhage](http://en.wikipedia.org/wiki/Intraventricular_hemorrhage).7

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| --- | --- |
| **grade** | **Appearance of hemorrahge** |
| **I** | None evident |
| **II** | Less than 1 mm thick |
| **III** | More than 1 mm thick |
| **IV** | Any thickness with intraventricular hemorrhage or [parenchymal](http://en.wikipedia.org/wiki/Parenchymal) extension |

**Fisher grade**

**PATIENTS AND METHODS:**

Thirty cases were involved in this study,15 males and 15 females, from may 2010 to may 2011, at the emergency department , of Kasr- EL Aini medical school, age was ranging from 25 yrs upto 65 yrs .All cases had full examination as regard history,clinical examination,CT on admission,CT angiography or 4 vessels angiography and CT f/u after 48hrs for 2 weeks,1month and 3month.Patients neurological status were evaluated according to Hunt and Hess grading. Patients with deteriorated neurological status Hunt &Hess grade zero upto grdae III and had hydrocephalus have gone under conservative traetment , patients with grade more than III and had hydrocephalus had v-p shunts.

**RESULTS:**

Thirty cases were involved in this study,15 males and 15 females, age was ranging from 25yrs upto 65 yrs,with mean age of 45yrs. 4 cases (13.3 %) had Gr. II bleeding, 14 cases (46.7 %) had Gr. III and 12 cases (40 %) had Gr IV. Sixteen cases (53.3 %) had V-P shunt and 14 cases (47.7%) had no V-P shunt .From 16 cases had V-P shunt, 1case (3.3 %) had Gr. II bleeding, 9 cases ( 30%) had Gr. III and 6 cases ( 20%) had Gr. IV. From 14 cases had no v-p shunt,3 cases had Gr.II bleeding (10%), 5 cases (16.7%) had Gr.III and 6 cases (20%) had Gr.IV bleeding.According to Hunt and hess grading .There were 20 cases (66.6 %) were Gr.II , 2 cases had had Gr. II bleeding, 16 cases were Gr. III and 2 cases were Gr. IV. There were 7 cases (23.3%) had Gr.III ,2 cases were Gr.II bleeding and 5 cases had Gr.III bleeding. There were 2 cases (6.7%) Gr. IV and had Gr.IV bleeding and finally there was 1 case Gr.1, had Gr.III bleeding.

**DISCUSSION:**

Spontaneous subarachnoid hemorrhage (hemorrhage between pia and arachnoid matter of the brain) has many causes ,one of the major causes is rupture of vascular lesions such as aneuryzms or arterio-venous malformation. Subarachnoid hemorrhage can lead to acute hydrocephalus by obstruction of CSF pathway or chronic hydrocephalus by development of subarachnoid gliosis

Thirty cases of subarachnoid hemorrhage with variable grades of bleeding according to Fischer grade enrolled in our study from may 2010 to may 2011.

Sixteen cases had v-p shunt (53.3%) 15 cases for acute hydrocephalus and one case for chronic hydrocephalus after 1.5 month. From our study we have noticed that cases with high grade bleeding III,IV were 26 cases ,15 cases (57.7%) had operated by v-p shunt and 11 cases (42.3%) had no shunt, 4 cases with gr.II only one case had shunt (25%) and 3 cases (75%) had no shunt.

We also got that 9 cases from 14 cases with gr.III bleeding had shunt (64.3%) and 6 cases from 12 cases with gr.IV had shunt (50%),more bleeding in subarachnoid space is more influencial to develop hydrocephalus than less bleeding in sub- arachnoid space with parenchymal or intraventricular extension.

**CONCLUSION:** Hydrocephalus is one of the major secondary complications of subarachnoid hemorrhage. We did not experience a big difference between cases with high grade bleeding that need shunt and cases that need no shunt , only 4 cases (15.4%) is the difference between the two groups and may be there are other factors that may affect the patients with subarachnoid hemorrhage to have v-p shunts for hydrocephalus, such as vasospasm and the patient neurological status

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***REFERENCES*:**

1. Van Gijn J, Kerr RS, Rinkel GJ (2007)."Subarachnoid haemorrahge *Lancet* 369 (9558): 306–18. [doi](http://en.wikipedia.org/wiki/Digital_object_identifier):[10.1016/S0140-6736(07)60153-6](http://dx.doi.org/10.1016%2FS0140-6736%2807%2960153-6). [PMID](http://en.wikipedia.org/wiki/PubMed_Identifier) [17258671](http://www.ncbi.nlm.nih.gov/pubmed/17258671).
2. . Feigin VL, Rinkel GJ, Lawes CM, *et al.* (2005) . ["Risk factors for subarachnoid hemorrhage: an updated systematic review of epidemiological studies"](http://stroke.ahajournals.org/cgi/content/full/36/12/2773) *Stroke* 36 (12): 2773–80. [doi](http://en.wikipedia.org/wiki/Digital_object_identifier):[10.1161/01.STR.0000190838.02954.e8](http://dx.doi.org/10.1161%2F01.STR.0000190838.02954.e8). [PMID](http://en.wikipedia.org/wiki/PubMed_Identifier) [16282541](http://www.ncbi.nlm.nih.gov/pubmed/16282541). <http://stroke.ahajournals.org/cgi/content/full/36/12/2773>.
3. Suarez JI, Tarr RW, Selman WR (January 2006). "Aneurysmal subarachnoid hemorrhage". *New England Journal of Medicine* 354 (4): 387–96. [doi](http://en.wikipedia.org/wiki/Digital_object_identifier):[10.1056/NEJMra052732](http://dx.doi.org/10.1056%2FNEJMra052732). [PMID](http://en.wikipedia.org/wiki/PubMed_Identifier) [16436770](http://www.ncbi.nlm.nih.gov/pubmed/16436770).
4. Allman, Keith G.; Iain H. Wilson (2006). *Oxford Handbook of anaesthesia, 2nd edition*. Oxford

University Press. pp. 408–409. [ISBN](http://en.wikipedia.org/wiki/International_Standard_Book_Number) [0198566090](http://en.wikipedia.org/wiki/Special:BookSources/0198566090).

1. Banki NM, Kopelnik A, Dae MW, *et al.* (2005). ["Acute neurocardiogenic injury after subarachnoid hemorrhage"](http://circ.ahajournals.org/cgi/content/full/112/21/3314). *Circulation* 112 (21): 3314–9. [doi](http://en.wikipedia.org/wiki/Digital_object_identifier):[10.1161/CIRCULATIONAHA.105.558239](http://dx.doi.org/10.1161%2FCIRCULATIONAHA.105.558239). [PMID](http://en.wikipedia.org/wiki/PubMed_Identifier) [16286583](http://www.ncbi.nlm.nih.gov/pubmed/16286583).
2. Rinkel GJ, van Gijn J, Wijdicks EF (1 September 1993). ["Subarachnoid hemorrhage without detectable aneurysm. A review of the causes"](http://stroke.ahajournals.org/cgi/reprint/24/9/1403). *Stroke* 24 (9): 1403–9. [PMID](http://en.wikipedia.org/wiki/PubMed_Identifier) [8362440](http://www.ncbi.nlm.nih.gov/pubmed/8362440). <http://stroke.ahajournals.org/cgi/reprint/24/9/1403>.
3. Claassen J, Bernardini GL, Kreiter K, *et al.* (September 2001). "Effect of cisternal and ventricular blood on risk of delayed cerebral ischemia after subarachnoid hemorrhage: the Fisher scale revisited".. *Stroke* 32 (9): 2012–20. [doi](http://en.wikipedia.org/wiki/Digital_object_identifier):[10.1161/hs0901.095677](http://dx.doi.org/10.1161%2Fhs0901.095677). [PMID](http://en.wikipedia.org/wiki/PubMed_Identifier) [11546890](http://www.ncbi.nlm.nih.gov/pubmed/11546890). <http://stroke.ahajournals.org/cgi/content/full/32/9/2012>