

## **Subarachnoid Haemorrhage - 25 Years' Experience at NIMHANS, Bangalore, India**

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~~V K Jan, E Ramakrishna, Thimmappa Hegde, A K Reddy .~~

Associate Professor of Neurosurgery, NIMHANS (formerly)

, B S Das .

Reprints request

&, G N Narayana Reddy .

Director, National Institute of Mental Health & Neuro Sciences, Bangalore - 560 029

,  
- *Department of Neurosurgery, National Institute of Mental Health & Neuro Sciences, Bangalore 560 029, India*

### ***Abstract***

Three hundred and fifty five cases of primary Subarachnoid Haemorrhage (SAH) have been analysed from the point of view of their incidence, clinical presentation and management. These have been divided into three etiological groups - aneurysms, Arteriovenous Malformations (AVM) and 'other SAH', (where a case for SAH was not found). Majority of the patients treated conservatively, were in poor clinical condition. The mortality for operated cases was 22.8 % for aneurysms and 28.6% for AVMs.

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Key words -

**Subarachnoid haemorrhage**

During the last three decades, there has been a better understanding in the diagnosis and management of primary Subarachnoid Haemorrhage (SAH). With improved techniques of radiology, advances in anaesthesia and introduction of microscope in surgery, etiological diagnosis in many patients of SAH can be achieved and they can be successfully operated upon.

There have been only a few publications in Indian literature on this subject [1], [2], [3], [4], [5], [6], [7], [8]. It was therefore thought worth while to review our experience at NIMHANS during the last twenty five years.

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### **Material and Methods**

All patients admitted to neurological services of the Institute from 1958 to 1983 (a period of 25 years) with primary SAH were included in the present study. Patients with a secondary cause for SAH in the form of hypertensive intracerebral haemorrhage, tumour bleed, trauma or blood dyscrasias detected by investigation, operation, autopsy or follow-up were not included in this study. The rest of the patients

were considered to have primary SAH.

Three hundred and fifty five cases of SAH were identified during the period. Records of all these patients were analysed to obtain maximum information regarding cause of SAH, mode of investigation, clinical presentation, treatment offered and the outcome. Three groups were formed depending on the cause of SAH

- (i) Aneurysms
- (ii) AVMs and
- (iii) other SAH ( where a cause for SAH was not found).

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## **Observations**

Out of the 355 cases seen only 58 patients were seen during the initial 17 years of study. The majority (297 cases) attended the Institute during the last eight years. In these eight years (1976 to 1983), the number of primary SAH admissions varied between 30 and 40 per year, except in 1981 when it was 54 (Fig. 1).

*.Yearly distribution of 355 cases of SAH and its causes*

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## **Investigations**

In earlier years four vessel angiography was not performed at NIMHANS. Therefore a large number of patients underwent bilateral carotid angiography (34 %) and unilateral angiography (25%). One fifth of the cases (21 %) underwent four vessel angiography (Table I). Seventy patients were not investigated by any of the contrast studies. Autopsy was done in 18 cases. Thus in 52 cases no procedure was undertaken to find out the cause of SAH.

*Table I - Modes of diagnosis*

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With the above investigations, the cause of SAH was found to be aneurysm in 31.8% of cases, AVM in 10.7% and it could not be detected in 57.5% cases. The most common site for the aneurysm as seen in 40 cases, was the anterior communicating artery. There were 33 aneurysms of the internal carotid artery, 26 of the middle cerebral artery, 7 of the anterior cerebral artery, 3 of the posterior cerebral artery and 2 of the vertebrobasilar artery (Table II a, b).

*Table II (a) - Aetiology*

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*Table II (b) - Site of aneurysm*

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## Clinical Presentation

Aneurysms and 'other SAH' were most common in the fifth and sixth decades while AVMs presented between the third and fifth decades (Table III). Though the incidence of aneurysm was only slightly more in females, the incidence of AVM and 'other SAH' was significantly higher in males than in females (Table III)

*Table III - Age and sex distribution*

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Only 17.4% of the total cases were either known to be hypertensive or were detected to be hypertensive (Table IV). Majority of the cases were brought to the hospital within a week after the ictus. A good number of patients i.e., 122 (34.36 %) were brought after one week of the ictus (Table V). Majority of the patients were brought to the hospital in grades I-III [9]. Only 16 % were brought in grades IV & V (Table VI).

*Table IV - Incidence of hypertension*

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*Table V - Duration between ictus and admission*

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*Table VI - Grade at the time of admission (Hunt and Hess)*

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## Treatment

All the patients were put to complete bed rest after admission. Blood pressure was controlled. None of the patients received antifibrinolytic agents. After investigations, if the case of SAH was not found, patients were continued on supportive treatment till discharged or otherwise. Such patients have not been reinvestigated by angiography except in a few of them who were later readmitted with bleeding. Fifty seven patients with cerebral aneurysms were operated. In 40 patients direct surgery was performed by way of clipping of the aneurysmal neck. Ten patients underwent carotid ligation. Wrapping of the aneurysm was performed in three cases and only evacuation of clot in three. Intracranial ligation of feeders was done in one patient who had an associated AVM. The practice of clipping aneurysm started in 1975. Earlier to this carotid ligation was an often performed procedure. Fifty six (49.6%) patients with cerebral aneurysms were treated conservatively. Majority of them could not be operated upon because of their moribund condition or they died soon after admission. The other reasons for not operating are evident from Table VII.

*Table VII - Reasons for not operating proved cases of aneurysms.*

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Twenty one (55.5%) patients with AVMs were operated. Excision of AVM was done only in twelve of them. Intracranial ligation of feeders was performed in five, carotid ligation in two, clot evacuation alone in one and external ventricular drainage in one. Both the carotid ligations were performed prior to 1975. Though the treatment of choice for AVM was surgery, 17 (44.5%) patients were treated conservatively. Among them, five were moribund at the time of admission, and five did not agree for surgery. In seven, the lesion was considered inoperable due to its large extent or deep location.

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## Outcome

Out of the 355 cases, 113 (31.6%) expired. The mortality was very high (reaching up to 50 %) in unoperated or conservatively treated cases. But then it cannot be compared with the operated ones because most of the conservatively treated patients were already in a very bad condition. Thirteen (22.8%) cases of aneurysms and 6 (28.6%) cases of AVMs expired in the operated group (Table VIII).

*Table VIII - Outcome of operated cases*

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## Discussion

The number of patients admitted with primary SAH was very low during the early years (1958-1975). It was probably due to lack of awareness amongst the general physicians and practitioners about this entity and its possible surgical treatment. In the contemporary Indian reports the incidence of SAH was also low [1], [2]. But as awareness increased, about the diagnosis and treatment of this condition, the number of cases coming to this hospital with primary SAH reached up to 40 per year. This is far below the western standards. Recently Sambasivan et al. [3] have reported 1000 SAH cases over a period of sixteen years i.e., an average of 62.5 cases per year.

Detection rate of the cause of SAH has been higher in the series published by the co-operative study [10] and that of Sambasivan et al. [3]. The percentage of cases of 'other SAH' group was 64 % in the ICMR study (Table I). We believe that with refinement of angiographic techniques, this group is likely to shrink further. However the rate of detection of AVMs has been high in our series compared to co-operative series [10] and ICMR study [11]. Sambasivan et. al [3] and Rout and Rai [12] have also reported higher incidence of AVMs. Sambasivan et. al. found 9 % of AVMs in 1000 cases of SAH over a period of sixteen cases. Rout and Rai [12] encountered 75 cases of cerebral angiomatous malformations out of 153 cases of intracranial vascular lesions over a period of five years.

The most common bleeding aneurysm found in the present study was that of the anterior communicating artery, while other workers [3], [11] found it in the internal carotid artery. Another unusual finding was that AVMs were more common in males (76.3%) while others [3], [11] have not found any significant difference among both the sexes.

Only 27.34% of all primary SAH patients were brought to the hospital during the first 24 hours. This probably indicates that we have been missing those cases of minor bleed who suffer from headache and vomiting for a short while. They come to the hospital only if severe headache persisted for a

longer duration or if deterioration occurred. Only 56% of the cases were admitted in grades I - III. It is felt that there is still a great need to bring an awareness amongst general physicians and practitioners regarding the SAH and impress upon them the possibility of treatable conditions like aneurysms and AVMs.

Incidence of SAH due to aneurysm rupture and those of 'other SAH' were maximum in fifth and sixth decades (Table III). Occurrence of hypertension in these groups was similar (Table IV). It is therefore postulated that many of the patients with 'other SAH' might have had a small aneurysm which might have got obliterated after the initial bleed and hence it was not picked up by convention.

More than 50 % of cases of Aneurysm and AVMs were in good condition after surgery in the present series. Thirteen (22.8%) cases of Aneurysm and 6 (28.6%) cases of AVM expired in the operated group (Table VIII). Sambasivan et al. [3] reported 22.6% mortality for Aneurysms where direct approach by surgery was undertaken and 8.6% mortality for those treated by carotid ligation or trapping. We feel, with the availability of microscope, appropriate clips and increasing expertise the mortality rate for surgically treated cases will further come down. Patients who were treated conservatively have fared very badly, though many of them were already in very poor state. Though the outcome for surgically treated cases is expected to improve, we may still have a large number of patients attending hospital after several bleeds and in moribund condition. It is expected that with increasing awareness of this condition amongst the physicians and the public, more number of patients will be seen after the initial minor bleeds and then the investigative procedures and surgery will have superior results.

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## Conclusion

1. The incidence of SAH patients reporting to hospitals in India is low compared to Western figures.
2. Bleeding AVMs were more common in males (76.3%).
3. Anterior communicating artery was the commonest site of ruptured aneurysm.
4. Operated cases fared better than those treated conservatively.

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