

**Original Article****Clinical Profile of Patients with non Traumatic Intracranial Bleed: An Observational Study at a Tertiary level Hospital in India**

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**Abstract**

**Introduction:** Intracerebral hemorrhage (ICH) is the second most common cause of stroke, trailing only ischemic stroke in frequency. This study aimed at describing and understanding the demographic and clinical profile of patients with non-traumatic ICH presenting to our centre.

**Methodology:** We did a hospital based observational study in the Department of Medicine, MVP's Dr. Vasantrao Pawar Medical College Hospital and Research Centre Adagaon, Nashik from May 2012 till December 2014 of 50 consecutive patients diagnosed with non-traumatic intracranial bleed. We obtained detailed history of the patients and findings of general, systemic and neurological examinations. Routine investigations were sent along with CT head and in some cases special investigations were sent. All patients were re-evaluated at the time of discharge to assess the prognosis and clinical outcome of patients. Descriptive analysis was performed using means and percentages. Statistical analysis was done to look for associations of site of hematoma with symptoms observed.

**Results:** Average age of the patients was  $60.86 \pm 11.08$  years, 62% of the population were males. 58% of the population had mean arterial pressure of less than equal to 140 mm Hg and had GCS of more than 9, 34% had scores more than 20. Headache was seen to be the most common symptom observed. Radiologically, more than 30cc of hematoma was seen in 66% of the patients and midline shift was observed in 38% of the patients.

**Conclusions:** Clinico-demographic variables of the patient can help us in assess the prognostic outcome in such patients.

**Keywords:** stroke, hemorrhage, outcome, complications, symptoms, mortality.

## Introduction

Intracerebral hemorrhage (ICH) is the second most common cause of stroke, trailing only ischemic stroke in frequency<sup>1</sup>. Estimates of the annual incidence range from 16 to 33 cases per 100,000.<sup>2</sup> Causes of nontraumatic ICH include hypertension, cerebral amyloid angiopathy, vascular malformations, hemorrhagic infarction (including venous sinus thrombosis), septic embolism, mycotic aneurysm, brain tumor, bleeding disorders, liver disease, anticoagulants, thrombolytic therapy, central nervous system (CNS) infection (eg, herpes simplex encephalitis), moyamoya, vasculitis and drugs like cocaine or amphetamines.<sup>3</sup> Hypertensive vasculopathy is the most common etiology of spontaneous ICH. Cerebral amyloid angiopathy is the most common cause of nontraumatic lobar ICH in the elderly, while vascular malformations are the most common cause of ICH in children.<sup>4</sup> Nontraumatic ICH causes 8 to 15% of all first-ever strokes in Australia, England, and the United States<sup>5</sup>. It accounts for 25% of strokes in Japan<sup>6</sup>. ICH is a neurologic and medical emergency because it is associated with a high risk of ongoing bleeding, progressive neurologic deterioration, permanent disability, and death. This study aimed at describing and understanding the demographic and clinical profile of patients with non-traumatic ICH presenting to our centre.

## Methodology

### Study Design and sample population

This is a hospital based observational study conducted in the Department of Medicine, MVP's Dr. Vasantrao Pawar Medical College Hospital and Research Centre Adagaon, Nashik. The study period was May 2012 till December 2014. A total of 50 consecutive patients diagnosed with non-traumatic intracranial bleed were included in the study. Patients aged more than 14 years, diagnosed with non-traumatic intracranial bleed were included in the study and were followed up until discharge. All patients or their relatives were explained the purpose of the study and an

informed written consent was obtained from the patients or their relatives when the patients were unconscious. We excluded patients with traumatic intracranial bleed, ischemic stroke, those patients where they or their relatives refused to consent for the study. The study was approved by the institutional ethics committee and performed according to the prescribed guidelines of Indian Council of Medical Research, New Delhi.

### Data Collection and Data Analysis

At the time of enrolment in the study, detailed history of the patients was obtained. This included age, gender and socio-demographic variables of the patients. All patients underwent detailed general, systemic and neurological examinations and the findings were noted in a pre-designed patient report form. We also performed Galsgow Coma Scale (GCS) and National Institutes of Health Stroke Scale (NIHSS) on each patient. A provisional diagnosis was made based on history and examination. All patients included in the study underwent routine investigations like hemogram, coagulation profile, urine, lipid profile and computed tomography of head. In some circumstances, at the discretion of the treating physician, patients received magnetic resonance angiography and venography, anti-neutrophil antibody, cerebrospinal fluid examination, protein C & S deficiency and anti-phospholipid antibody testing. All patients were re-evaluated at the time of discharge to assess the prognosis and clinical outcome of patients. All the data collected were entered in Microsoft Excel sheet and then imported in and analyzed using SPSS software ver. 17. Descriptive analysis was performed using means and percentages. Statistical analysis was done to look for associations of site of hematoma with symptoms observed. P value less than 0.05 was taken to be statistically significant.

## Results

We included 50 patients in the sample during the period of the study. Average age of the patients was  $60.86 \pm 11.08$  years, majority of them being more than 60 years of age (Table 1). 62% of the

population were males. 58% of the population had mean arterial pressure of less than equal to 140 mm Hg and had GCS of more than 9. On NIHSS, 36% had scores less than 10, 34% had scores more than 20 and remaining had scores between 11 and 20 (Table 1). Mainly 4 clinical symptoms were noted in the patients; headache, vomiting, loss of consciousness and convulsions. Headache was seen to be the most common symptom observed, and that to mostly in patients with bleed in putamen and internal capsule area. Second most common symptom observed was vomiting, again seen most commonly in patients with bleed in the putamen and internal capsule region (Table 2). Radiologically, more than 30cc of hematoma was seen in 66% of the patients. These patients had 88% mortality. Midline shift was observed in 38% of the patients with 100% mortality. Hydrocephalus was noted in 36% patients with 83% mortality and intraventricular extension was seen in 22% patients with 100% mortality (Table 3).

**Table 1.** Characteristics of patients involved in the study

	n (%)
Total patients	50
Age distribution	
14-40 years	2 (4%)
41-60 years	22 (44%)
More than 60 years	26 (52%)
Gender	
Males	31 (62%)
Females	19 (38%)
Mean arterial pressure	
Less than equal to 140 mm Hg	29 (58%)
More than 140 mm Hg	21 (42%)
Patients on anticoagulation	5 (10%)
Glasgow coma scale score	
Less than 4	8 (16%)
5 to 8	14 (28%)
More than 9	29 (58%)
National Institutes of Health Stroke Scale	
0 to 10	18 (36%)
11 to 20	15 (30%)
More than 20	17 (34%)

**Table 2.** Clinical presentation in relation to site of non-traumatic intracranial bleed

Site	Symptoms			
	Headache	Vomiting	Loss of consciousness	Convulsions
Putamen & Internal capsule	18	16	9	5
Cerebellum	2	1	1	0
Lobar	9	6	2	5
Pons	3	3	0	2
Thalamus	9	10	8	5
Total	41	36	20	17
p value	0.29	<0.05	<0.05	0.43

**Table 3.** Radiological characteristics of patients included in the study

	n (%)	Mortality
Volume of hematoma in contingency coefficient		
More than 30 cc	33 (66%)	88.23%
Less than equal to 30 cc	17 (34%)	42.42%
Midline shift		
Yes	19 (38%)	100%
No	31 (62%)	32.25%
Hydrocephalus		
Yes	18 (36%)	83.33%
No	32 (64%)	43.75%
Intraventricular extension		
Yes	11 (22%)	100%
No	39 (78%)	46.15%

## Discussion

Previous studies have reported various risk factors for developing non-traumatic ICH, of which hypertension is the most important one. In one study of 331 consecutive cases by Thrift et al, hypertension more than doubled the risk of ICH.<sup>7</sup> In a meta-analysis by Jackson et al, that pooled data from 28 studies, hypertension was twice as common in patients with deep ICH as in patients with lobar ICH (odds ratio [OR] 2.1, 95% CI 1.82-2.42).<sup>8</sup> It has been seen that anticoagulation with warfarin increases the risk of ICH two to five times, depending upon the intensity of anticoagulation. Not only that, retrospective evidence suggests that warfarin therapy with an international normalized ratio (INR) >3 is a risk factor for larger initial hemorrhage volume as well as poorer outcomes after ICH.<sup>9</sup> Headache, vomiting, and lower level of consciousness are reported if the hematoma becomes sufficiently

large. Headache and vomiting occur in approximately 50% of patients with ICH. Traction on meningeal pain fibers, increased intracranial pressure (ICP), or blood in the cerebrospinal fluid (CSF) are the usual causes of pain after an ICH; and is seen most commonly with cerebellar and lobar hemorrhages. Patients may sometimes complain of a stiff neck and have meningismus on physical examination, if there is intraventricular blood. In our study a total of 17 patients had seizures after an ICH. Seizures in the first days after ICH occur in almost 30% of patients; and are observed more commonly in lobar hemorrhages than in deep or cerebellar ICHs.<sup>10</sup> In a series by Vespa et al of 63 patients with ICH in an intensive care unit who had continuous electroencephalogram monitoring, seizures within 72 hours of admission occurred in 29% and were often nonconvulsive.<sup>11</sup> In addition, the presence of seizures was independently associated with midline brain shift and neurologic deterioration.

In our study population, patients with a NIHSS score more than 20 had a mortality of 94% which was comparable to study done by Cheung et al, where the mortality among patients with NIHSS score more than 20 was 80%.<sup>12</sup> We observed that volume of hematoma more than 30 cc was associated with a mortality of 88.23%. while patients in the study done by Martini et al had 74% mortality.<sup>13</sup> Neuroimaging with brain CT or MRI is essential to confirm the diagnosis of ICH and to exclude ischemic stroke and stroke mimics as possible causes. Both CT and MRI are considered first-choice imaging options for the emergency diagnosis and assessment of ICH.<sup>14</sup>

### Conclusion

Non traumatic intracranial bleed is a disease associated with high mortality and morbidity despite recent improvements in management. The clinical presentation of hemorrhagic stroke varies and patients most commonly present with symptoms like headache, vomiting, convulsion, loss of consciousness followed by seizures, speech disorders. Radiologically volume of hematoma

more than 30 cc, midline shift, hydrocephalus are also associated with an increased mortality can be a useful tool in assessing the prognostic outcome.

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**Conflict of interest:** None

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