



FUNDOSCOPIC PROFILE IN PATIENTS PRESENTING WITH ACUTE HAEMORRHAGIC STROKE IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Objective: Hypertension causes microvascular damage in both the cerebral and retinal circulation. The retinal vessel pathology serves as an important marker for stratification of patients risk for having or developing cerebrovascular disease. The objective of this study was to ascertain the fundoscopic changes in patients presenting with acute haemorrhagic stroke also fundus examination may potentially provide additional information on long term stroke risk stratification.

Methods: In this prospective study 50 patients above 18 years of age with CT scan diagnosed Intracranial Haemorrhage attending MGM Hospital Emergency Department for treatment from January 2016 to September 2016 were included.

Results: Mean age was 52.34 ± 5.49 years, and most of them were males. The main risk factor was hypertension, with 21.05% complying with therapy. Other risk factors were alcohol consumption, smoking etc. The majority of patients belonged to 5th and 6th decades. Retinal abnormalities were found to be present in 60% of the patients with Haemorrhagic stroke. Dilated Fundoscopy of patients having CT Scan diagnosed Hemorrhagic stroke showing Grade 3 and Grade 4 retinopathy had poor prognosis.

KEYWORDS : Haemorrhagic Stroke, Direct and Indirect Fundoscopy, Hypertension Intracerebral Haemorrhage (ICH)

INTRODUCTION

Stroke or Cerebrovascular accident (CVA) is the commonest neurological emergency and is rated third amongst the causes of death in the world.

Many studies have shown that hypertensive ocular Fundoscopic abnormalities are clearly related to stroke, even after controlling the level of blood pressure and other vascular risk factors. There is increasing evidence that small-vessel disease is a systemic vascular disorder that can be a major cause of stroke¹

Retinal abnormalities are indicative of a breakdown of the blood-retina barrier confer a greater increase in risk for stroke than sclerotic retinal changes. Similar retinal changes also have a positive relationship with stroke mortality. Hypertensive ocular fundus abnormalities are also reported to be associated with an increased risk for cognitive impairment, cerebral atrophy, progression of MRI-defined white matter lesions, and subclinical infarction.

Diverse study types provide evidence for the association between ocular fundus changes and cerebrovascular disease. Histologic studies showed that fibrous or fibro-hyalinoid thickenings of the retinal arteries near the optic disc reflect intracerebral arterial abnormalities, and are associated with an increased risk of both cerebral hemorrhage and cerebral infarction². Functional studies of the retinal vasculature show that prolonged retinal arteriovenous passage time is associated with lacunar infarction, confirmed by CT scan³.

Hypertension causes microvascular damage in both the cerebral and retinal circulations². Because the retinal and cerebral vessels share embryological and anatomical characteristics. Retinal vasculature is a circulatory system in the eye that can be observed without invasive procedures and provides useful information about the microcirculation system in the body^{4,6}.

The most widely used scale for grading hypertensive retinopathy is the Keith, Wagener, and Barker classification, which grades retinopathy from I to IV based on its severity.

Hence this study was performed to look for fundoscopic changes in patients presenting with acute haemorrhagic stroke confirmed by

CT scan and try to form a correlation between them.

METHODS

Study design and patient population:

In this prospective study 50 patients 18 years of age and above including both sexes with CT scan diagnosed Intracranial Haemorrhage attending MGM Hospital, Navi Mumbai Emergency Medicine Department for treatment from January 2016 to September 2016 were randomly selected.

Inclusion Criteria: 1. Patients equal to or above 18 years age of both sexes 2. CT SCAN diagnosed cases of spontaneous intracerebral haemorrhage.

Exclusion Criteria: 1. Head injury 2. Ischaemic Stroke 3. Other causes of Hypertensive Retinopathy.

DATA COLLECTION:

Data regarding different risk factors in detail has been collected by interviewing patient's attendants/ relatives or the patient himself. Clinical parameters at the time of admission like the blood pressure etc. were taken into consideration. Dilated funduscopy was done with the help of Direct and Indirect Ophthalmoscope. Dilatation of eyes was done with the eye drops containing Tropicamide(0.8%) + Phenylephrine(5%), CT Scan diagnosed patients with Intracerebral Haemorrhage were included. Prognostic factors were studied and outcome was assessed in terms of in-hospital mortality.

RESULTS:

Among 50 cases of ICH studied, there were 37(74%) males and 13(26%) females. The male to female ratio was 2.84:1. The majority of patients belonged to 5th and 6th decades. The overall mean age of study group was 52.34 ± 5.49 years.

FIGURE 1: HYPERTENSIVE STATUS

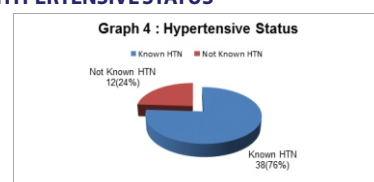


FIGURE shows 38(76%) cases were known hypertensives, and 12(24%) had no known history of Hypertension. Among 38 known hypertensives, most of them 78.94% were on irregular treatment. Only 21.05% were taking regular treatment.

FIGURE 2: Fundoscopy and sex differentiation

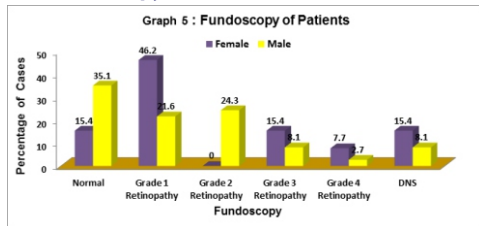


Figure 2: Fundus examination revealed normal fundus picture in 15 cases (30%).

Grade I hypertensive Retinopathy in 14 (28%), Grade II retinopathy in 9 (18%) cases, Grade III retinopathy was seen in 5 (10%) cases and the fundus was not visualized due to cataract in 5 (10%) cases out of 50. Only two patients were found to have Papilloedema / Grade IV retinopathy.

TABLE 1: Fundoscopy and outcome

Fundus	Alive	%	Dead	%	Total	%
DNS	4	80.0	1	20.0	5	100.0
Grade 1 Retinopathy	7	50.0	7	50.0	14	100.0
Grade 2 Retinopathy	4	44.4	5	55.6	9	100.0
Grade 3 Retinopathy	1	20.0	4	80.0	5	100.0
Grade 4 Retinopathy	0	0.0	2	100.0	2	100.0
Normal	13	86.7	2	13.3	15	100.0
Total	29	58.0	21	42.0	50	100.0
Chi-square Test						12.826*
P-value						0.025
Significant						YES

*Statistically highly significant at 5% level i.e., P<0.05.

DNS = Details Not Seen

The Patients with Grade 4 Retinopathy/Papilloedema had 100% mortality, followed by Grade 3 Retinopathy which also had 80% mortality in our study. Least mortality was seen in patients with Normal Fundoscopy i.e 13.3%.

Hence, Grade 3 and Grade 4 Retinopathy shows Bad prognosis.

TABLE 2: Mean Blood pressure and Outcome

Blood Pressure	Total	Alive		Dead		Chi square test	P - Value
		N	%	N	%		
SBP >180 mmHg	26	11	42.3	15	57.7	5.476*	0.019
SBP ≤ 180 mmHg	24	18	75.0	6	25.0		
TOTAL	50	29	58.0	21	42.0		
DBP >110 mmHg	27	11	40.7	16	59.3	7.177*	0.007
DBP ≤ 110 mmHg	23	18	78.3	5	21.7		
TOTAL	50	29	58.0	21	42.0		
MAP >140 mmHg	32	14	43.8	18	56.3	7.410*	0.006
MAP ≤ 140 mmHg	18	15	83.3	3	16.7		
TOTAL	50	29	58.0	21	42.0		

*Statistically significant at 5% level i.e., P<0.05.

The mortality was more than two times (57.7%) among patients who had systolic B.P > 180 mmHg compared to those who had systolic BP <180 mmHg (25.0%)

The mortality was more than two times (59.3%) among patients who had diastolic BP>110 mmHg compared to those who had diastolic BP<110 mmHg (21.70%).

The mortality was more than three times (56.30%) among patients who had MAP>140 mmHg compared to those who had MAP<140 mmHg (16.73%)

Higher the SBP, DBP and MAP, higher was the mortality rate.

DISCUSSION:

In our study 60% of the patients with CT diagnosed acute Haemorrhagic Stroke had retinal abnormalities, the prevalence of retinal abnormalities including potentially blinding diseases was found to be (57.4%) in stroke patients in the Nigerian study⁷. This is quite close to the findings in stroke patients of Singapore (59%)⁸.

In Britain, retinal abnormalities were found to be uncommon in hypertensive patients (3–21%)⁹, this is likely to be related to the level of awareness and better control of blood pressure.

Among the 50 cases of hemorrhagic stroke studied, the incidence of Intracerebral haemorrhage increased as the age advanced. In our study up to 75% of hemorrhagic stroke occurred in the age group of more than 50 years. Males outnumbered females but not statistically significant.

Among 38 known hypertensives most of them 78.94% were on irregular treatment. Only 21.05% were taking regular treatment. Among hypertensives irregular treatment / non-compliance was a major problem found in our study. This is comparable to similar study done by Qureshi et al.¹⁰

It is evident in our study that patients who had systolic BP > 180 mm Hg and diastolic BP >110 mm Hg had mortality of 57.7% and 59.3% respectively. So the initial blood pressure plays a major role in the outcome. Both increase in systolic and diastolic blood pressure had poor prognostic outcome. Data is comparable to Kumaravelu et al.¹¹ The limitations of this study include the likelihood that we must have underreported some of the retinal abnormalities because we did not use sensitive instruments like a digital retinal camera. Secondly, we examined the patients after pupillary dilatation; this may not be feasible in all patients. Effort should be made to use modern methods that can give adequate information through undilated pupils.

CONCLUSION:

Evaluating for the retinal signs, along with the assessment of the presence or absence of other known vascular risk factors, may allow clinicians to further individualize a risk profile for stroke for each patient. This would permit more accurate risk stratification and, potentially, play a role in guiding treatment strategies.

Finding suggests that a Retinal examination may be valuable for the assessment of stroke risk in patients with hypertension.

Those who have hypertension, fundus examination may potentially provide additional information on long term stroke risk stratification.

The retinal abnormalities found in these patients can be used as markers of stroke risk for other patients. All patients presenting with hypertension should be referred to ophthalmologist for routine fundus examination and documentation.

The major risk factor in our study was hypertension. Thus, measures to ensure adequate control of hypertension, abstinence from alcohol and smoking may reduce the incidence of Stroke.

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