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Medicine

CLINICAL PROFILE OF STROKE- A STUDY OF 100 PATIENTS.

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ABSTRACT Cerebrovascular Accident or Stroke is defined as an abrupt onset of a focal neurological deficit that is particularly attributable to a focal Vascular Cause. Stroke is a worldwide health problem. It makes an important contribution to morbidity, mortality and disability in developed as well as in developing countries.5 Stroke is a difficult disease to study because of differing etiologies, heterogeneity of symptoms, varying severity and spontaneous recovery. Additionally, recovery is difficult to measure because it may be neurological, adaptive or a combination of both. This prompted attempts to define variables that can be used for prognostication. The present study comprised of study of 100 patients of acute stroke admitted to Medicine Department of Our Hospital To Study the Clinical Profile of Stroke with Special Reference to Risk Factors, Presenting Clinical Features, Complications, Management and Outcome.

KEYWORDS : STROKE.

INTRODUCTION:

Cerebrovascular accident is also called Stroke.[1]
The Stroke is a disease of vascular system of brain.

1)Stroke: The World Health Organisation defines Stroke as " the rapidly developing clinical symptoms and / or signs of focal (at times global) disturbance of cerebral function, with symptoms lasting more than 24 hours or leading to death with no apparent cause other than that of vascular origin.[2]

2)Transient ischaemic attacks (TIA): A TIA is a clinical syndrome characterized by an acute loss of focal cerebral or monocular function with symptoms lasting less than 24 hours and which is thought to be due to inadequate cerebral or ocular blood supply as a result of arterial thrombosis or embolism associated with arterial, cardiac or haematological disease[3].

MAGNITUDE OF PROBLEM:

Stroke is the second leading cause of death and disability following coronary artery disease not only in western countries but worldwide[4].The reports regarding incidence of stroke, which are available in India, are mostly based on hospital statistics. These hospital figures of stroke do not reflect the true magnitude of disease in population and therefore cannot give true perspectives.

Thus population based studies are more informative about the incidence and prevalence of stroke.

Community surveys from different regions of India show a crude prevalence rate for strokes presumed to be of vascular origin in the range of 200 per 1,00,000 persons. Analysis of data from major university hospitals suggest that 1.5% of all hospitals cases, 4.5% of medical and approximately 20% of all neurological admission are from strokes[5]. In recent times, there appears to be significant decline in the incidence of stroke mortality[6], despite the fact that the relative distribution of cerebrovascular disease lesions (ischaemic and haemorrhagic) in hospital cases has not changed over the years.

RISK FACTORS OF ISCHEMIC STROKE[7]:

1)Nonmodifiable risk factors:
a) Age.
b) Gender.
c) Race.
d) Family history.
e) Genetics.

2) Modifiable risk factors:
a) Arterial hypertension.
b) Transient ischemic attacks.
c) Prior stroke.
d) Asymptomatic carotid bruit/stenosis.
e) Cardiac disease.
f) Diabetes mellitus.
g) Dyslipidemia.
h) Aortic arch atheromatosis.
i) Cigarette smoking.
j) Alcohol consumption.
k) Increased fibrinogen.
l) Elevated homocysteine.
m) Low serum folate.
n) Elevated anticardiolipin antibodies.
o) Obesity.

MATERIALS AND METHODS:

Type of study:
This study was conducted on patients of acute stroke admitted to General Medicine units of our Hospital. Informed consent was taken from patient or his/her legal guardian. In this study 100 patients of stroke were included. Through clinical evaluation and neuroimaging, blood investigations, haemoglobin, total leukocyte count, blood sugar, urea, creatinine, sodium, potassium estimations were performed.

The patients were followed up for a maximum period of 7 days from the onset of stroke, and patients were grouped as

1. Outcome A – Improved/Survivors
2. Outcome B – Death/NIH score deterioration ≥ 4 in 24 hrs.

Statistical analysis was carried out among the significant parameters to identify independent predictors of 7-day fatality.

Source of data:
100 Patients diagnosed to have Cerebrovascular Accident admitted inDepartment of Medicine in our Hospital during the study period.

Method of collection data:
Patients satisfying the inclusion and exclusion criteria were selected

for the study on the basis of purposive sampling method.

Inclusion criteria:

- Patients who had suffered an acute stroke according to WHO Definition of Stroke.
- Patients showing Cerebral Infarct, Venous Thrombosis or Intracerebral Haemorrhage on CT/MRI Brain.
- Only patients with history of onset of symptoms 7 days or less prior to admission were included.

Exclusion Criteria:

- Patients with neurological deficit lasting for less than 24 hours.
- Patients with active infections or history of same within 3 months of study.
- Patients with stroke due to other causes like tuberculoms, tumors etc.
- Patients with subarachnoid haemorrhage.
- Unattended patients, where no history was available.

The data for the collection of study was collected in a Proforma which includes prognostic factors of Cerebrovascular Accidents like Age, Sex, Hypertension, and Diabetes Mellitus. The prognostic factors of cerebrovascular accidents mentioned in the above said Proforma details along with other prognostic factors like Infarct and Haemorrhage, Lacunar Infarct and Non-Lacunar, Supratentorial and Infratentorial Haemorrhage in brain was studied.

The following investigations were done in patients of cerebrovascular accidents.
1) Complete Haemogram.
2) Random blood sugar level on admission (Distribution of RBS was as hypoglycaemia <60mg/dl, euglycemia: 60-129.9mg/dl and hyperglycaemia: >130mg/dl.)
3) Fasting blood sugar if Random blood sugar is elevated.
4) Postprandial blood sugar if Random blood sugar is elevated.
5) Chest X-ray.
6) ECG.
7) Serum lipid profile.
8) CT scan of Head done within 3 days of admission to hospital.
9) Lumbar puncture and CSF analysis if indicated.
10) Bleeding time and Clotting time if indicated.
11) VDRL if indicated.
12) HIV antibodies detected by ELISA if indicated.
13) Echocardiogram if indicated.
14) Acute phase reactants like ESR (ESR was categorised in to "low ESRgroup" in men with ESR

$\chi = \frac{\sum(Oi-Ei)2}{Ei}$, Where Oi is the observed frequency and Ei the expected frequency

Cross-tabs procedure (Contingency coefficient analysis):
The Cross-tabs procedure forms two-way and multi-way tables and provides a variety of tests and measures of association for two-way tables. The structure of the table and whether categories are ordered determine what test or measure to use.

Independent samples' test:
The Independent-Samples T Test procedure compares means for two groups of cases. Ideally, for this test, the subjects should be randomly assigned to two groups, so that any difference in response is due to the treatment (or lack of treatment) and not to other factors. This is not the case if you compare average income for males and females. A person is not randomly assigned to be a male or female. In such situations, you should ensure that differences in other factors are not masking or enhancing a significant difference in means. Differences in average income may be influenced by factors such as education and not by sex alone.

Significant figures
* Suggestive significance 0.05<P<0.10
** Moderately Significant 0.01<P<0.05
*** Strongly Significant <0.01

DISCUSSION:
AGE AND SEX:-
Age is the strongest predicator of stroke.

In our study the incidence of stroke increased with age and the highest incidence was seen in the age group 61 – 75 years (42.86 %) followed by 46 – 60 years (28.57 %). In the study by Y. Bahou et al, 2004, the incidence of stroke was maximum in age group 61 – 70 years (34.5 %).

TABLE - Age and sex distribution in various studies.

STUDY	PEAK INCIDENCE AGE GROUP (IN YEARS)	MALE : FEMALE RATIO
JOTIBEB et al (1998)	60 – 70	1 : 1
DAS et al (1998)	60 – 70	1.4 : 1
SRINIVAS et al (1998)	50 – 60	2.8 : 1
BAHOU et al (2004)	61 – 71	-
PRESENT STUDY	61 – 75	2.65 : 1

Increased incidence in older age group is likely due to atherosclerosis and hypertension and other risk factors of atherosclerosis. The incidence of stroke in young was 16 % in our study. Data from major Indian hospitals show 24 to 35 % of stroke in young of all neurological admissions. The result of present study closely correlates with the studies of Charles T Itty et al who observed an incidence of 19.8 % and Gauri LA et al who observed an incidence of stroke in young of 19 %.

TABLE - Comparative study of incidence of stroke in young.

STUDY	% OF YOUNG STROKES
CHARLES T ITTY et al (2000)	19.8 %
GAURI LA et al (2001)	19 %
PRESENT STUDY	16 %

The overall male to female ratio was 2.65 : 1. This closely correlates with the study of Srinivas et al (1998) with a male to female ratio of 2.8 : 1 and Gauri LA etal (2001) with a ratio of 2 : 1. The males are at higher risk because of the higher prevalence of various factors in male population like hypertension, diabetes, smoking, alcoholism, atherosclerosis etc. The female preponderance at still older age (>80 yrs) may be related to the lower life expectancy in men in general and earlier death in men with vascular risk factors.

MEAN TIME DELAY:-In the present study mean time delay was less than 24 hrs in 90 %. In Mukherjee et al study of 80 patients 87.5 % patients were admitted within 24 hours. In our study maximum number of patients (58 %) presented between 2 – 6 hours of onset of stroke.

MODE OF ONSET:-In infarct group onset was mostly sudden with maximum deficit at the onset (66.67 %) correlated with the study of Mohr et al and Julien et al. In cerebral haemorrhage group the most common type of onset was sudden onset with smooth progress over next 12 hours (59.09 %) which also correlated with the above studies.
RISK FACTORS:-It is seen from the study that systemic hypertension is the most important risk factor in patients of stroke having either infarction (84.62 %) or haemorrhage (100 %).

Hypertension increases the risk of stroke by causing lipohyalinosis of arteries leading to thrombosis and rupture of the weakened vessels by chronic hypertension micro aneurysm formation and rupture of

small vessels.

41.03 % patients with infarct and 72 % with haemorrhage had past history of hypertension. Didier Smadja et al (2001) in his study observed an incidence of hypertension in 71.2 % of patients with infarction and 68.7 % with haemorrhage. Jyoti Wadhwani et al (2002) observed an incidence of hypertension of 26.97 % cases of infarction and 39.58 % in cases of haemorrhage.

Past history of transient ischaemic attack and / or stroke was found in 16 % of our patients (10.26 % in patients with infarct and 36.36 % patients with haemorrhage). Jyoti Wadhwani et al (2002) observed an incidence of TIA/stroke in 9.7 % of infarction and 18.75 % of patients of haemorrhage.

Diabetes Mellitus was present in 32 % of the cases (31.18 % patients with haemorrhage and 32.05 % of patient s with infarct).

Jyoti Wadhwani et al (2002) who reported incidence of diabetes mellitus in 10.53 % patients of infarction and 4.16 % patients of haemorrhage.

Diabetes causes stroke primarily due to accelerated thrombosis, which has been clearly proved by the Framingham study which demonstrated 2.4 to 3.5 times acceleration of atherosclerosis.

Incidence of smoking and alcoholism in our study was found in 64 % and 24 % of the patients respectively. Thus there is an increased risk of cerebrovascular disease amongst smokers and alcoholics which was also observed by Wolf PA et al (1988) and the found 15 – 30 times more risk of cerebrovascular disease in smokers compared to non-smokers. Tobacco chewing was seen in 30 % of the patients of stroke.

Various studies have different incidence of various habits like in Jyoti Wadhwani et al smoking was observed in 27.5 % and alcoholism in 31.9 % of ischemic stroke. This may be due to the patient selection and various cultural habits in various ethnic groups.

Rheumatic heart disease was found only in 4 % cases of cerebral infarction while Ischemic Heart Disease was found in both infarction and haemorrhage in 9.7 % and 36.36 % respectively. Dider Smadja et al (2001) observed an incidence of ischemic heart disease in 6.1 % patients of infarction and 3.6 % of haemorrhage.

Hyperlipidaemia (S. Cholesterol >200 mg/dl) was seen in 19 % (17.95 % in infarct group and 22.73 % in haemorrhage group) of the patients in our study. This observation was slightly higher than the study of Dider Smadja et al (2001), who observed hypercholesterolemia in 12.6 % and 3.6 % of infarction and haemorrhage respectively.

Most of the patients observed had multiple risk factors.

CLINICAL FEATURES:-

The onset of clinical features in patients of ischemic stroke was most commonly (66.67 %) sudden onset with maximum deficit at the onset in case of cerebral infarction whereas in haemorrhagic stroke most commonly (59 %) it was sudden onset with smooth progress over 30min to 12 hrs. (p=0.003) Hemiplegia (92 %) was found to be the most common presenting feature in both haemorrhage and infarction. Right hemiplegia (52.17 %) and left hemiplegia (47.83 %) had nearly equal incidence (right slightly greater than left. This finding correlates with the study of Kamaljit Kaur et al (2000) who in their study observed that right hemiplegia (51%) was only slightly more than left sided (49 %).

Altered sensorium (including loss of consciousness) was more common in haemorrhage (72.73 %) than infarction (28.20 %). It correlates with the study of Harrison MJG et al (1980) who observed a value of 62 % in their study.

Similarly headache, vomiting and seizures were more common in intra cerebral haemorrhage than cerebral infarction. This also correlates with Harrison MJG et al study (1980).

Dysarthria or aphasia was observed in 58 % cases which correlate with Julian et al (46 %). Mukherjee et al observed speech disturbances in 85 % of the patients.

Facial nerve was the most common (74 %) cranial nerve to be involved in patients with stroke. Pupillary asymmetry and Conjugate deviation was more common (36.36 % each) in haemorrhage than infarct (15.39 % and 7.69 % respectively) in our study as compared to 24 % in each haemorrhage and infarction in study by Schaafsma et al. There is highly significant increase in the incidence of increased Intracerebral haemorrhage in patients who presented with altered sensorium, headache, vomiting as compared to infarction. These findings help in the differentiation of haemorrhage and infarction.

C.T. SCAN BRAIN FINDINGS AND ITS CORRELATION WITH OUTCOME:-

The incidence of cerebral haemorrhage and ischemic stroke in the present study was 22 % and 78 % respectively. Cardioembolic strokes accounted for 4 % of all strokes and all had rheumatic heart disease.

TABLE - Types of Stroke By C.T. Brain Findings

STUDY	HAEMORRHAGE	INFARCT
RASMUSSEN et al	11 %	89 %
DAS et al	45 %	47 %
SRINIVAS et al	56 %	44 %
Mohr et al	11 %	89 %
PRESENT STUDY	22 %	78 %

58 % of the lesions were left sided and 38 % were right sided and the rest 4 % were bilateral. In Rasmussen et al it was equal in both sides and 4 % had bilateral lesions.Because of the lesion size or the presence of more than one lesion, patients are registered in many groups. In 70 % patients, the lesions were in the parietal lobe followed by basal ganglia 34 % and frontal lobe 26 % in our study. Occipital lobe and thalamus were less affected (6 % each).In this study 79.49 % of CVA patients with cerebral infarction had good outcome, 20.51 % of CVA patients with cerebral infarction had poor outcome. 36.36% of CVA patients with intracerebral haemorrhage had good outcome and 63.64 % patients with intracerebral haemorrhage had poor outcome. Hence infarction had better prognosis than haemorrhage (p<0.001). This correlates with a study done by Abu-Zeid HA, Choi N W, Hsu PH, Maini KK.98which showed that survival was better in infarction than in haemorrhage.

In this study, 96.65 % CVA patients with lacunar infarction had good short term outcome (A) whereas 70 % of CVA patients with non-lacunar infarction had good outcome (A) and in patients with large infarction (occupying > 1/4th of cerebral hemisphere), only 33.33 % patients had good short term outcome (p<0.001).

Hence, lacunar infarction had good prognosis than non-lacunar infarction. Patients with large infarction had even worse (66.67 %) short term prognosis in terms of mortality or clinical deterioration (p<0.001, LR=22.994). This observation correlates with study by Salgado AV et al (1997)112 which noted similar observations.

In this study 50 % CVA patients with supratentorial haemorrhage had poor outcome and 80 % of CVA patients with infratentorial haemorrhage had poor outcome. This correlation was statistically insignificant (p=0.204) which may be due to smaller sample size of patients with haemorrhage and over all poor outcome in patients with haemorrhage in both the subsets.

A study by Rosenow F,Hojer C et al (1997)119also observed that case fatality is low if haemorrhage is localized to cerebral lobes when

compared to localization of haemorrhage in brainstem and cerebellum. This is because vital centres are located in Brain stem.

CORRELATION OF LEVEL OF CONCIOUSNESS WITH SHORT TERM OUTCOME IN STROKE

Level of consciousness was one of the strongest prognostic variable of short term outcome (p<0.001). Out of the 38 patients presenting with altered sensorium 57.89 % of the patients had poor outcome.

Similar results were obtained in the study by Giuseppe Azzimondi et al, Italy.

CORRELATION OF BLOOD PRESSURE AT THE TIME OF PRSENTATION OR SUBSEQUENT FEW HOURS WITH SHORT TERM OUTCOME IN STROKE

In our study it was observed that patients presenting with a mean arterial pressure of more than 130 mmHg (64 %) had poorer outcome (B) (p<0.001) as compared to patients with MAP in between 60 – 129 mmHg (16.43 %).

It was also observed that patients with MAP less than 60 mmHg had poor outcome (B) in 100 % (2 out of 2).

There are conflicting views on the prognostic significance of hypertension immediately following acute stroke - Robinson et al demonstrated that an increase in systolic blood pressure by 10 mmHg after stroke significantly predicted poor outcome. Jorgensen et al, however, demonstrated that the relative risk of stroke progression decreased by a factor of 0.66 for each 20 mmHg increase in systolic blood pressure.

A mean arterial blood pressure <60 mmHg is usually associated with loss of cerebral auto regulation and decline in cerebral perfusion pressure and hence accounting for poor prognosis.

From our study it can be inferred that patients with very high blood pressure (> 130 mmHg) have bad short term prognosis as compared to patients normotensive or hypertensive with MAP between 100 – 129 mg/dl. This may as severe hypertension may promote early brain edema and increase the risk of haemorrhagic transformation.

It is suggested that if systolic blood pressure exceeds 220 mmHg, if mean arterial blood pressure exceeds 130 mmHg, or if the patients exhibits hypertensive encephalopathy, then short-acting agents that can be easily titrated, such as labetalol or enalapril, should be considered. At present, an acute reduction of blood pressure carries a risk of potentially worsening ischemia in patients with cerebral infarction by reducing cerebral perfusion pressure.

CORRELATION OF BODY TEMPERATURE WITH SHORT TERM OUTCOME IN STROKE

In our study 90 % of patients having hyperthermia (temperature > 37.5 °C) within 48 hours of stroke had poor short term prognosis (outcome B) as compared to 15 % in normothermics (p<0.001, LR=41.536).

Similarly a meta-analysis by Hajat et al suggested that a temperature >37.0 °C in the first week was significantly associated with an increase in mortality and morbidity.

Schwarz et al in their study of patients with stroke did not find that initial body temperature was an independent explanatory prognostic factor, but they did find that increased body temperature during the first 72 hours, was associated with poor outcome.121 In the study by David M. et al. (1995) it was shown that fever is consistently associated with worse outcomes across multiple outcome measures.

José Castillo et al. observed that the relationship between brain damage and high temperature is greater; the earlier the increase in temperature occurs. However any infectious origin of hyperthermia was not associated with poorer outcome or greater infarct volume.

In a study by Yang Wanget al125admission body temperature was a significant predictor of in-hospital mortality in the final multivariate logistic regression model

CORRELATION OF RANDOM BLOOD SUGAR ON ADMISSION WITH SHORT TERM OUTCOME

Admission hyperglycemia was an independent predictor for poor outcome after stroke122, though National Institutes of Health Stroke Scale deterioration (≥4 points within 24hrs) or mortality rates did not significantly increase until reaching 180 mg/dL (88.89 %).

Mortality after stroke is very high 55.56 % in non-diabetics with stress hyperglycemia and in uncontrolled diabetics (85.51 %) and least in nondiabetics without any hyperglycemia (14.55 %)104, 105.Although the mortality rate in known diabetics was higher than that in the normoglycemic group, the differences did not reach statistical significance(p=0.124)114. These results suggest that tight control of blood glucose may be indicated in the hyperacute phase.

Hyperglycemia when compared to outcome separately with different types of stroke, it correlated significantly with patients having cerebral infarction (p<0.001) whereas in patients with haemorrhagic stroke it showed no significant statistical correlation (p=0.137). This may be due to smaller sample size and higher mortality in haemorrhagic group per se (in both hyperglycemics and normoglycemics).

This systematic overview shows that in patients with no history of diabetes who have an ischemic stroke, even moderately elevated glucose levels are associated with both a 3-fold higher risk of short-term mortality and an increased risk of poor functional recovery compared with lower glucose levels. This finding is supported by studies showing higher mean admission glucose level in non-survivors of stroke compared with survivors.

It is also supported by multivariate analyses of data from a large study by Bruno A et al124studied "Acute blood glucose level and outcome from ischemic stroke.", in which admission glucose level was a significant predictor of mortality or poor functional recovery after stroke independent of other prognostic factors.

Weir et al demonstrated that plasma glucose >8 mmol/l (140 > mg/dl approx.) after acute stroke predicted poorer chances of survival and independence Christopher J Weir et al. studied a long term follow up study on whether hyperglycaemia is an independent predictor of poor outcome after acute stroke. They concluded that plasma glucose concentration above 8 mmol/l after acute stroke predicts a poor prognosis after correcting for age, stroke severity, and stroke subtype.

Tracey A. Baird et al. studied and concluded that persistent hyperglycemia on serial glucose monitoring is an independent determinant of infarct expansion and is associated with worse functional outcome. There is an urgent need to study normalization of blood glucose after stroke.

CORRELATION OF SERUM SODIUM WITH SHORT TERM OUTCOME

Serum sodium levels were found to have a direct correlation (p<0.001, LR=59.38) with short term outcome (B). Hyponatremia was noted in 80 % of the patients with Outcome B and 85.71 % of the patients with hyponatremia had poor outcome.

Wannamethee G et al in their study showed that all-cause and non-cardiovascular mortality were significantly increased at serum sodium levels of < 139mmol/l.

CORRELATION OF GLASSGOW COMA SCORE WITH SHORT TERM OUTCOME

93.75 % of the patients with GCS < 9 had worse outcome and in the group of patients with GCS of 9 – 12, it was 50 %. Lower GCS hence was an indicator of poor prognosis even in patients with stroke (p<0.001).

CORRELATION OF ERYTHROCYTE SEDIMENTATION RATE WITH SHORT TERM OUTCOME

There was a significant association between higher ESR and short term outcome in patients with stroke. 59.09 % of patients with high ESR had poor outcome (B) (p<0.001).

Chamorro et al123had observed similar findings. Since clinical worsening at such an early phase of stroke is most frequently due to thrombosis, it might be speculated that ESR is an indirect marker of thrombus formation.

NATIONAL INSTITUTE OH HEALTH STROKE SCALE (NIHSS) DETERIORATION AND ITS CORRELATION WITH MORTALITY

NIHSS is one of the most widely used stroke scales for assessing the prognosis of the patients with acute stroke.

A NIHSS deterioration of 4 during the 1st 24 hours of admission significantly correlated (p<0.001) with mortality in patients with stroke.

RJ Wityk et al126described similarly that the change in stroke score from admission to 24 hours correlated strongly with the change by 7 to 10 days, suggesting that early changes in stroke score may be a predictor of outcome. It also defined major neurological deterioration as either death or an increase in score by 4 or more points.

SUMMARY AND CONCLUSIONS:

The statistical operations were done through SPSS (Statistical Presentation System Software) for Windows, version 16 (SPSS Inc.: New York) and Excel programme.

All data are expressed in the form of tables, figures and charts as suitable.

The present comprises of study of clinical profile of stroke and prognostic factors of short term outcome which includes level of consciousness, Mean arterial pressure, blood sugar, ESR, serum sodium and CT Brain correlation in 100 patients of cerebrovascular stroke admitted in G. G. Hospital, Jamnagar from March 2010 to August 2011.

The following conclusions were drawn:

- The highest incidence of stroke was seen in age group of 60 to 75 years (42.86 %).
- The incidence of stroke in young (age <45 years) was 16 % in our study.
- The male to female ratio was observed to be 2.65: 1.
- 90 % of the patients presented within 24 hours of outcome.
- Sudden onset with maximum deficit at the onset of stroke was more common in cerebral infarction while sudden onset often catastrophic with smooth progression was more common in cerebral haemorrhage.
- Headache, vomiting, altered sensorium, convulsion, hypertension were more common with cerebral haemorrhage than in cerebral infarction.
- Hypertension was the most important risk factor identified (88 %) other important risk factors included smoking, diabetes, atherosclerosis, coronary artery disease, hyperlipidaemia etc.
- The most common presentation was motor weakness in the face – arm – leg pattern associated with speech defect. Other clinical manifestations were homonymous hemianopia, hemisensory deficit, diminished deep tendon reflexes and sphincter disturbances.
- Alteration of level of consciousness on admission was much more common in patients with haemorrhage than in infarction.
- Rheumatic heart disease was found only in 4 % of patients with stroke and all had cerebral infarction.
- Previous episodes of TIA/stroke ware observed in patients with haemorrhage (36.36 %) and infarction (10.26 %).
- There were significant differences in presentation of strokes due to cerebral thrombosis and cerebral haemorrhage on the basis of which it was often possible to diagnose nature and site of lesion clinically. Coma, conjugate deviation of eyes, asymmetrical pupils, bilateral positive Babinski's sign, bilateral absent corneal reflexes, neck spasm, stertorous breathing and decerebrate rigidity were more common on cerebral haemorrhage than in infarction. But due to significant overlap of symptoms it was often difficult to differentiate clinically massive infarct and haemorrhage.
- The most common complications included intravenous site infections (30 %), pressure sores (18 %), aspiration (12 %), catheter related urinary tract infection (8 %) and deep vein thrombosis (3 %).
- Incidence of infarction was higher (78 %) than of haemorrhage (22 %).
- The overall mortality at the end of 7 days was 16 %. Mortality was significantly higher (45.46 %) in cerebral haemorrhage as compare to infarction (7.69 %).
- In patients with cerebral infarction, lacunar infarcts had significantly better outcome (70 %) than non-lacunar infarcts. Large infarcts occupying more than a quarter of cerebral hemisphere had ever worse prognosis with 66.67 % having poor short term outcome (B).
- Supratentorial haemorrhage had poor outcome in 50 % where as it was 80 % in infratentorial one. Although the difference was not statistically insignificant other similar studies in the past showed prognosis in supratentorial was better than infratentorial haemorrhage.
- It was noted that blood pressure was an independent prognostic factor in stroke. Mean arterial pressure less than 60 mmHg and greater than 130 mmHg had poor outcome (100 % and 64 %). MAP > 130 mmHg had even worse outcome on haemorrhagic stroke with a poor outcome in 85.7 %.
- Patients having hyperthermia (temperature > 37.5 °C) had poor short term prognosis (90 %) than normothermics.
- Hyperglycemia on admission had a detrimental effect on the prognosis of patients with stroke. Mortality was higher both in diabetic as well as non-diabetic patients who had random blood sugar > 140 mg/dl. Mortality was even more in patients with RBS > 180 mg/dl.
- Hyperglycemia when compared with prognosis in patients with cerebral haemorrhage, it did not show significant difference as both the groups with or without hyperglycemia showed similar prognosis (outcome B).

- From our study it was clear that outcome was worse in patients with hyperglycemia irrespective of the fact that they were diabetic of non-diabetic. So hyperglycemia on admission can be considered as an independent risk factor. Raised plasma glucose concentration is therefore unlikely to be solely a stress response and should arguably be treated actively.

- Patients with hyponatremia even marginal or subnormal levels (< 138 meq/l) showed poor outcome (B) in patients of acute stroke (80 %).

- A Glasgow Coma Score of less than 9 in patients with acute stroke had worse short term outcome (93.75 %) and a score of greater than 12 was associated with good prognosis (A). Hence GCS which was primarily developed for patients with head injury can also be used in prognostication of patients with acute stroke.

- The NIH Stroke Scale is a convenient, rapidly applied scale for neurological assessment that correlates with other measures of stroke outcome, such as infarct size on CT. A score deterioration of 4 or more had direct correlation with the mortality and/or clinical deterioration of the patient (92.86 %). Interestingly, the change in stroke score from admission to 24 hours correlated strongly with the change by 7 to 10 days, suggesting that early changes in stroke score may be a predictor of outcome.

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