INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

CORRELATION BETWEEN ASPECT SCORE OF NCCT SCAN/DIFFUSION WEIGHTED MRI AND FUNCTIONAL NEUROLOGICAL OUTCOME IN PATIENTS OF ACUTE ISCHEMIC STROKE.

Medicine

Dr. Sagar. S. Rashinkar*
3rd Year Postgraduate In Internal Medicine, Department Of Medicine, Shri B. M. Patil Medical College And Hospital, BLDE University, Vijayapura *Corresponding Author

Dr. P. G. Mantur
M D(General Medicine) Associate Professor Of Medicine, Department Of Medicine, Shri B. M. Patil Medical College And Hospital, BLDE University, Vijayapura

ABSTRACT

INTRODUCTION-"Stroke—a generic term meaning sudden onset of a neurologic event—is also referred to as a cerebrovascular accident (CVA) or "brain attack." The distinction between cerebral ischemia and cerebral infarction is subtle but important. In cerebral ischaemia, the affected tissue remains viable although blood flow is inadequate to sustain normal cellular function. In cerebral *infarction*, frank cell death occurs with loss of neurons, glia, or both.Timing is important in patient triage. *Hyperacute* stroke designates events within the first 6 hours following symptom onset. In hyperacute stroke, cell death has not yet occurred, so the combined term *acute cerebral ischemia-infarction* is often used. *Acute* strokes are those 6-48 hours from onset"[1].

"Alberta Stroke Program Early CT score (ASPECTS) is a valid, robust and reliable method to judge degree of early ischaemic changes (EIC) (focal parenchymal hypo-attenuation, loss of graywhite differentiation, and sulcal effacement) on CT scan in patients with acute ischemic stroke"[2]."ASPECTS has been shown to have modest prognostic value for determining clinical outcome after intravenous tissue plasminogen activator (i.v. tPA) in management of acute ischaemic stroke"[3]."The mRS is the most widely used global outcome scale in clinical trials for stroke. The MRS is also associated with long term prediction after stroke"[4].

METHODS-Prospective cohort study,45 patients of acute ischaemic stroke included,Study period from janurary 2018 to janurary 2019 at shri b.m.patil medical college and hospital.Aspect score of NCCT on admission and modified rankin scale on admission and on 7th day calculated and compared. Data presented in mean,standard deviation and diagram.association between variables was found using chi square test.Data were analysed using spss software version seventeen.A pvalue of <0.005 was considered statistically significant.

RESULTS-we studied 45 patients in which 73.3% with aspect score >7 had good functional neurological outcome at day 7,statistically significant (p=0.001).26.7% patients with aspect score <7 had worst functional neurological outcome at day 7,statistically significant (p=0.001).no statistically significant correlation found between aspect score and risk factors diabetes mellitus type 2 and essential hypertension(p=0.420).

CONCLUSION-Aspect score determined on ncct scan/diffusion weighted mri on day of admission can serve as useful marker to predict early functional neurological outcome

KEYWORDS

stroke, Aspect score, mRS

INTRODUCTION

"Stroke is the third leading cause of death in many industrialized countries and is the major worldwide cause of adult neurologic disability. The age-adjusted incidence rate is about 180 per 100,000 per year.

Strokes affect patients of all ages—including newborns and neonates—although most occur in middle-aged or older adults. Children with strokes often have an underlying disorder such as right-to-left cardiac shunt, sickle cell disease, or inherited hypercoagulable syndrome. Strokes in young adults are often caused by dissection (spontaneous or traumatic) or drug abuse.Presentation. Stroke symptoms vary widely, depending on the vascular territory affected as well as the presence and adequacy of collateral flow.Sudden onset of a focal neurologic deficit such as facial droop, slurred speech, paresis, or decreased consciousness is the most common presentation.Prognosis in individual patients depends on a number of contributing factors, i.e., which vessel is occluded, the presence or absence of robust collateral blood flow, and whether there is a significant ischemic penumbra.Nearly half of all strokes have inadequate collateral blood flow and no significant penumbra. Most patients with major vessel occlusions—even those with a significant ischemic penumbra—will do poorly unless blood flow can be restored and the brain reperfused.Uncontrolled brain swelling with herniation and death can result from socalled malignant MCA infarction. In such cases, emergent craniectomy may be the only treatment option.Speed is essential, with the goal of a "door to needle" time (i.e., from arrival in the emergency department to intervention) under 60 minutes. Transporting stroke patients by EMS directly to the imaging suite can reduce the door-to-needle time to under 30 minutes.The single most important factor in successful intervention is patient selection, with the two most important considerations being (1) elapsed time from symptom onset and (2) imaging findings on the screening NECT scan"[1]. The alberta stroke program early computed tomography score (aspects) is widely used in clinical practice to assess the extent of early ischemic changes on brain imaging for acute stroke treatment. aspects

has been applied to various imaging modalities in acute stroke imaging since its introduction in 2000. aspects is a 10-point scoring system with anatomical regions distributed over the mca territory.**Modified Rankin Scale (mRS)**,utmostly utilized clinical aftereffect magnitude for ischaemic infarct clinically.In patients endured agony of stroke,this scale consistently used to detect dependence in daily activities.0 - None complaints.1 - None serious unability can do routine work,with few complaints.2 –little unability.can do self care needing no help,however can't do previous work.3 - modest unability. Walkable unaided. 4 - Modestly serious unability.not capable do own affairs without assistance, and assistance needed to walk.5 - Serious incapability. Have need of regular tending care and attention, bedridden, incontinent.6 - Dead.

METHODS-

Prospective cohort study,45 patients of acute ischaemic stroke included.Study period from janurary 2018 to janurary 2019 at shri b.m.patil medical college and hospital. Inclusion criteria -acute ischaemic stroke,age>21years,Presenting within 72hrs of onset of symptoms,risk factors included essential hypertension and type 2 diabetes mellitus. Exclusion criteria:anterior or posterior cerebral artery infarction, posterior circulation infarction, infarction due to cortical venous thrombosis and past history of stroke.Outcome measures included-mortality and morbidity by comparing aspect score on admission and modified rankin scale on day 7.The Alberta Stroke Program Early CT Score (ASPECTS) gives a means of quantitatively assessing acute ischemia on CT images by using a 10-point topographic (M1–M6, I = insula, IC = internal capsule, L = lenticular, and C = caudate), each of which accounts for one point in the total score[1].The normal CT scan is assigned a total score of 10. For each area involved in stroke on the unenhanced CT images, one point is deducted from that score. Hence, a score of 0 translates into a finding of diffuse ischemic involvement throughout the MCA territory[1].mRS scoring-0=no symptoms present at all,1=no disability despite some symptoms,2=slight disability but does not require assistance,3=moderate disability but can walk,4=moderately severe

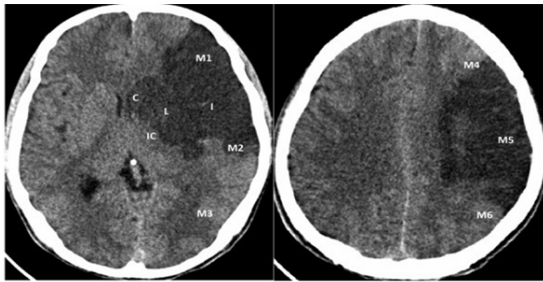disability, 5=severe disability, usually bedridden,6=dead[4].

Figure 2: Unenhanced CT brain (Patient no. 18), axial section at level of basal ganglia on left image and at supraganglionic level on right image. There is hypodensity in caudate nucleus, lentiform nucleus, insular cortex, M1, M2, M4, M5 and M6 regions on left side, resulting ASPECTS of 2.

STATISTICAL METHODS- Data presented in mean,standard deviation and diagram. association between variables was found using chi square test. data were analysed using spss software version seventeen .

RESULTS-
Total 45 patients of acute ischaemic stroke studied.

Table 1:Descriptive Statistics

Variabs	N	Minimum	Maximum	Mean	Std. Deviation
Age	45	35	92	63.64	13.38
ASPECT	45	4	9	7.38	1.419
mRS at admission	45	1	5	3.64	1.351
mRS at 7th Day	45	0	6	2.96	1.609

Maximum age was 92years and minimum age was 35years with mean age of 63.64 years.Aspect score maximum was 9 and minimum 4 with mean score of 7.38.mRS at admission maximum 5 and minimum 1 with mean of 3.64.mRS at 7th day maximum 6 and minimum 0 with mean of 2.96.
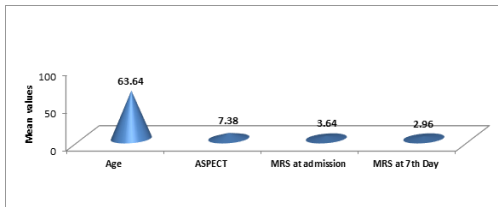

Table 2:Distribution of patients according to ASPECT

ASPECT	No. of Patients	Percentage
Worst progress(<7)	7	15.6
Good Progress (7+)	38	84.4
Total	45	100.0

Table 4:association Between Aspect Score And mRS at 7th day.

Association between ASPECT and MRS at 7th Day										
ASPECT	mRS at 7th Day								Chi square test	Remark
	0	1	2	3	4	5	6	Total	χ2=21.818 P=0.001	Highly Significant
Worst Progress (<7)	0	0	0	0	2	10	0	12		
%	0%	0.0%	0.0%	0.0%	40%	77%	0	26.7%		
Total Good Progress (7+)	1	11	8	3	3	3	2	33		
%	100%	100.%	100.0%	100.0%	60.%	23%	100%	73.3%		
Total	1	11	11	8	3	15		45	2	
%		100.0%	100.0%	100.0%	100.0%	100.0%		100.0%	100.0%	
NS-Not significant										

Significant Association Found Between Aspect Score On Admission And Mrs At 7th Day With P=0.001,statistically Significant
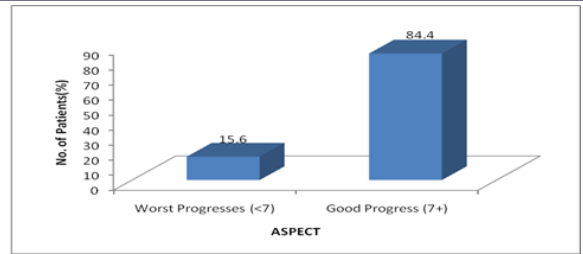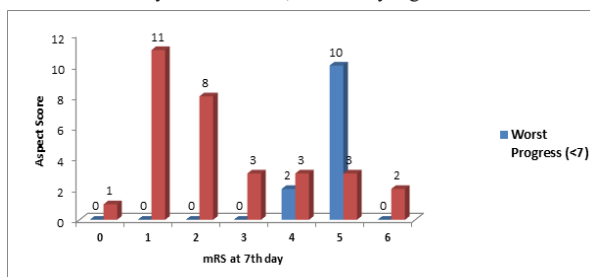
Out of 45 patients, patients with worst progress <7,were 7 and good progress 7+ were 38.

Table 3: Association Between Aspect Scores And Hypertension

Association between ASPECT and Hypertension					
ASPECT	Hypertension			Chi square test	Remark
	No	Yes	Total	χ2=0.651 P=0.420	NS
Worst Progress (<7)	0	0	12		
%	0.0%	0.0%	26.7%		
Total Good Progress (7+)	1	11	33		
%	100.0%	100.0%	73.3%		
Total	1	11	45	2	
%	100.0%	100.0%	100.0%	100.0%	
NS-Not significant					

No Significant Association Between Aspect Score And Hypertension (p=0.420) Found.

Table 4:association between aspect score and diabetes mellitus

Association between ASPECT and Diabetes Milletus					
ASPECT	Diabetes Miletus			Chi square test	Remark
	No	Yes	Total	χ2=0.650 P=0.420	NS
Worst Progress (<7)	11	1	12		
%	28.9%	14.3%	26.7%		
Total Good Progress (7+)	27	6	33		
%	71.1%	85.7%	73.3%		
Total	38	7	45	2	
%	100.0%	100.0%	100.0%	100.0%	
NS-Not significant					

No significant association found between ASPECT score and DIABETES MELLITUS (p=0.420).

We studied 45 patients in which 73.3% with ASPECT score >7 had good functional neurological outcome at day 7,statistically significant (p=0.001).26.7% patients with ASPECT score <7 had worst functional neurological outcome at day 7,statistically significant (p=0.001).No statistically significant correlation found between ASPECT score and risk factors diabetes mellitus type 2 and essential hypertension(p=0.420)

DISCUSSION-
In this study, we predicted stroke outcome by topographic quantitative scoring on CT scan after acute ischemic stroke who had presented within 72 hours of stroke onset. ASPECTS is good predictor of mortality and morbidity following stroke onset. These results agree with PARESH ZANZMERA et al[2],2012 among 100 patients with acute

mca infarction (median age 55 yrs, 62 males), median aspects scores had inter-rater reliability of 0.82. the mortality, gcs and nihss at discharge, and mrs and bi at 3 months are significantly better among patients with 'better' compared to 'worse' apsects. The hospital stay was shorter in patients with better aspects. and study done by JULIAN SCHRODER et al[5] 2015 also agrees with results of present study. ASPECTS value of 7 or below sharply discriminated the patients who were highly unlikely to achieve an independent functional outcome as evident by this study

CONCLUSION:

ASPECT SCORE DETERMINED ON NCCT SCAN/DIFFUSION WEIGHTED MRI ON DAY OF ADMISSION CAN SERVE AS USEFUL MARKER TO PREDICT EARLY FUNCTIONAL NEUROLOGICAL OUTCOME

REFERENCES-

1). Osborn's Brain ; Anne G. Osborn MD FACR, Gary L. Hedlund DO , Karen L. Salzman MD.IMAGING,PATHOLOGY AND ANATOMY;2ND EDITION.
2) Prediction of stroke outcome in relation to Alberta Stroke Program Early CT Score (ASPECTS) at admission in acute ischemic stroke: A prospective study from tertiary care hospital in north India Paresh Zanzmera et al.
3) Alberta Stroke Program Early CT Scale Evaluation of Multimodal Computed Tomography in Predicting Clinical Outcomes of Stroke Patients Treated With Aspiration Thrombectomy Marios-Nikos Psychogios et al.
4) Clinical scales to assess patients with stroke Harold p Adams,jr.
5) A Critical Review of Alberta Stroke Program Early CT Score for Evaluation of Acute Stroke Imaging Julian Schröder et al.