A PROSPECTIVE CLINICAL STUDY OF TRANSIENT ISCHEMICATTACKSANDMINORISCHEMICSTROKESMANAGEDONEMERGENCYBASIS

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Abstract:

Background: Stroke is a leading cause of death and disability. About 15-20% of patients withstrokehaveaprecedingTransientIschemicAttack(TIA) orMinorIschemicStroke(MIS)suggesting that these warning events provide us a golden opportunity for strokeprevention. The objectives of the study were to diagnose TIA/MIS accurately and rapidly excluding stroke mimic, risk stratification according to ABCD2 score, to start the best possible treatment immediately to prevent stroke and other vascular events within one year

Methods: The study included 43 patients with TIA/MIS, adequate data was collected, risk stratification done according to ABCD2 score and each patient was subjected to complete blood count, prothrombin time andpartial thromboplastin time, serum electrolytes, blood urea, serum creatinine, fastingblood glucose, HbA1c, lipid profile; neuroimaging with CT brain, MRI brain (T1W, T2Wand FLAIR), MR Angiography of brain; neck doppler study electrocardiogram,echocardiogram.

Results: Out of 43 patients, 19 (44.18%) were TIA patients and 24 (55.81%) patients were MIS patients. Most common risk factor was hypertension 34 (79.06%) in both TIA and MIS group. Of 43 patients 38 were completely recovered with no signs where as 5 patients had minor deficit that is NIHSS≤ 5 at the time of admission, risk of MIS also increases with increase in ABCD2 score.

Conclusion: Theresults ofour prospectivestudy showedthatrapidevaluationand earlyinitiationoftreatmentforTIA/MIShelpssignificantlytoreducetheriskofcompletedstrokeandothercardiovas culareventsanddeathinfirstthreemonths.

Key words: TIA, MIS, ABCD2 score, NIHSS**.**

Introduction

Stroke is a leading cause of death and disability. About 15-20% of patients withstrokehaveaprecedingTransientIschemicAttack(TIA) orMinorIschemicStroke(MIS)[1] suggesting that these warning events provide us a golden opportunity for strokeprevention. AfteraTIA, theriskofcompletedstrokeisupto8% withinthe first8to15days[2]. Becausediffusion-weightedimagingshowsasmallamountofbraintissuedamage in most cases of TIA.TIAs often represent minor strokes[3] and hence should beconsideredanemergency[4].

Although the concept of TIA arose in the 1950s and effective therapies for strokeprevention post-TIA had been well established, the first publication of the effectivenessofround-the-clockaccess(SOS-TIA)todiagnoseandtreatTIAwithoutdelayonlyappeared in2007[5].

TheEXPRESSstudybroughtconvincingevidencethatthecombinationofproventherapiesgiventopatientswithin24 hoursofsymptomsonsetdramaticallyreduce theriskofsubsequentstrokeat3months[6].

Various scores have been developed to stratify risk of development of stroke in apatient with TIA/MIS. The most commonly used scoring system is ABCD2 Score but ithas limitation. This score along with factors like imaging and etiology of TIA/MIS haveshownbetterpredictability ofriskofearly stroke[7,8,9] . There is a need for urgent evaluation and treatment of these patients to reducethe risk of stroke. Recent studies (Express study andSOS-TIAstudy)showedmorethan 80% riskreductionat90days.

Methodology:

This is a prospective study, hospital based done during the period 1st November2014to31st October2016 in

Department ofMedicine,Katuri medical college & Hospital, Guntur, Andhra Pradesh. It is a tertiary care centerand has TIA clinic with 24 hours access.

Inclusion Criteria: patients who presented within 24 hours of sudden onset of retinal orcerebral focal symptoms related to ischemia and recovered completely or with minimaldeficit thatis National InstituteofHealthStrokeScale[NIHSS]≤5were included.

Exclusioncriteria: Patientspresentingafter24hoursofonsetofsymptoms,withNIHSS>5,andwithothercause oftransientneurologicaldeficit.

Data Collected: Age,sex,windowperiod,timedurationofsymptoms,riskfactors,NIHS score at thetimeofadmission.Risk stratification doneaccordingto ABCD2score.

Investigations: EachpatientwithTIA/MISwasevaluatedwithin24hoursofpresentation. Assessment was done with complete blood count, prothrombin time andpartial thromboplastin time, serum electrolytes, blood urea, serum creatinine, fastingblood glucose, HbA1c, lipid profile; neuroimaging with CT brain, MRI brain (T1W, T2Wand FLAIR), MR Angiography of brain; vascular neck Doppler study; Cardiac evaluationwithelectrocardiogram,echocardiogram.

Clinical follow up and outcome measures:The follow-up assessment was done at 48hours, 1 week, 1 month, 3 month andone year. If personal follow-up was not obtained, telephonic calls were made for followupespecially forthefirst3months.Primaryoutcomewastheriskofstrokewithin3 months and secondaryoutcome measures werestroke,cardiovascularmorbidityandothervascularmorbidityandmortality inoneyear.Theresultswereanalyzedbycalculatingpercentages,themeanvalueandstandarddeviation&by usingMicrosoftexcel&spsssoftware.

Observation and Results

A. TotalData:

Totalnumberofischemicstrokepatientis1002admittedinKaturiMedicalCollege andhospital within duration of two years (1st November 2014 to 31stOctober2016).43patients(4.29%,n=1002)withTIA/MISincludedinstudywhopresentedwithin24hoursofonsetofsymptomsandrecoveredcompletelyorwithminorneurological deficit that is NIHSscore≤5andexcludingothercauseoftransientneurologicaldeficit.Outof43patients19(44.18%)aretransientischemicattackpatientsand24(55.81%)areminorischemic strokepatients as shown in Fig.

B. AgeandSexDistribution:

Inpresentstudyageisrangingfrom37yearsto80years.AgedistributionaccordingtoMean±SDwas58.26±11.10 as shown in Table. 1. Outof43patients,31(72.1%)patients aremaleand12(27.9%)arefemale as shown in Table. 2.

C. RiskFactors:

In present study most common risk factor was hypertension 34 patients (79.06%)in both TIA and MIS group. Other risk factors in decreasing orders are diabetes 20patients(46.51%);smoking12patients(27.90%);Dyslipidemia9patients(20.93%)andcardiac diseases 5 patients (11.62%; **1** patient's post aortic valve replacement, **1** postCABG with sever LVD, **1** DCMP with severe LVD andAtrialfibrillation,**2**patientswithIHDwithsevereLVD).27patients(62.79%)hadtwoormoreriskfactors.Distributionofrisk factorsin TIAand MISgroupare shownin Fig. 2

D. RiskstratificationaccordingtoABCD2score:

Risk stratification was done according to ABCD2 score for each patient. Score of0-3 is low risk, 4-5 moderate risk and 6-7 high risk. Out of 43 patients, there were 14patients (32.55%) with low risk, 19 patients (44.18%) moderate risk and 10 patients(23.25%) high risk. As per study, Risk of MIS also increases with increase in ABCD2score as shown in Fig. 3

E.Outcome of the study

The follow-up assessment was done at 48hours, 1 week, 1 month, 3 monthand 1year.Primaryoutcome measurewastheriskofstrokewithin3 months. Secondaryoutcomeswerestroke,acutecoronarysyndromeandothervascularmorbidityandmortalityinoneyear.During3months follow-upnonehadcompletedstroke.2patients(4.65%) hadrecurrent TIA/MIS (Table. 3)

DISCUSSION

Stroke is one of the leading causes of mortality and morbidity worldwide. One in10 patients with TIA will develop new-onset stroke within 90 days with more than 50%occurring in the first seven days. About 15-20% of patients with stroke have a precedingTransient Ischemic Attack (TIA) on Minor Ischemic Stroke (MIS) suggesting that thesewarningeventsprovideusagoldenopportunityforstrokeprevention

A recent systematic review and meta-analysis demonstrated a strong correlationbetween the degree of urgency of intervention and specialization of stroke services andthe risk of early stroke after TIA. The lowest risks occurred in studies of emergencytreatment using specialized stroke services and highest risks occurred in population-basedstudiesthatdid notinvolveurgenttreatment[10].

TheOxfordbasedEarlyuseofExistingPreventiveStrategiesforStroke**(EXPRESS)** study used a prospective, sequential (before versus after) comparison toreport the impact of a change in the process of care of people with TIA and minorischemic stroke. RapidresponsetoTIAassessmentandinterventionshasemergedastheinternationalgoldstandardsincetheoxford-basedstudygroupledbyRothwelldemonstrated the potential for an 80% reduction in the rates of conversion from TIA tostroke in the EXPRESS study. In phase 1 of their study (without rapid response),10.2% of patients who sort medical attention for TIA/MIS had „recurrent stoke". Thisdecreased to 2% in phase 2(with rapid assessment and treatment). The key variable inExpress study is the time between the first sign of TIA and assessment of the conditionand initiation of treatment. If the delay between TIA and initiation treatment

more than48-72hours,the90daysriskofrecurrentstrokeincreasesfrom2%to10.2% [11].

In the Paris based SOS-TIA study, the 90 days stroke rate was 1.24% (95% CI 0.72-2.12)compared with an ABCD2 score predicted rate of 5.96%, about an 80% relative riskreduction. The one-year rate of myocardial infarction and vascular death (1.1%) wasabouthalfthatestimated frommeta-analysis [12].

Accordingtothenationalstrokeassociationthereisevidencethatinitiatingsecondary stroke prevention therapies in hospital results in high rates of adherence totherapy atfollow up [13].

Long term studies show that 20 to 30% of people with TIA will go no to have astroke with the greatest risk in the first few weeks. A systematic review demonstratedthatthereportedriskofstrokeafterTIAvariedsignificantlyaccordingtostudymethodology. In studies that used active outcome ascertainment, the risk of strokefollowing TIA was 9.9% at two days, 13.4% at 30 days and 17.3% at 90 days. Thesefigures are at least double the rates identified in earlier studies that relied on passiveascertainment methods[14].

A Californian study of people attending emergency departments with recent TIAidentifiedanoverallstrokeriskof10.5%at90days;50timeshigherthanthatexpectedofacohortofsimilarage. Furthermore, strokes following TIA were fatal in 21% of patients and disabling inanother64%.Thepopulation-basedOxfordvascularstudy(**OXVASC**)foundevenhigherratesofstrokefollowingarecentTIAwith8%at1week ,11.5%atonemonthand 18.2%atthreemonths[15].

People with TIA are also at increased risk of cardiovascular events. In a meta-analysisof39studiesinvolvingalmost66,000peoplewithTIA,theannual riskofmyocardial infarction was 2.2% and non-stroke vascular death 2.1%[16]. Studies thatenrolled people in the first days after TIA demonstrate that a significant number of non-stroke cardiovascular events occur within the first 90 days[17].

IndianprospectivestudyKateMetal.,,earlyriskandpredictorsofcerebrovascularandcardiovasculareventsintransientischemicattackandminorischemicstroke"showed18(15.3%)ofthe118patientsenrolleddevelopednewcerebrovascular or cardiovascular events during the 90 days of follow-up. 5.9% (7/118)hadnewstroke,4.2%(5/118)patientsdevelopedearlydeterioration,2.5%(3/118)patientshadrecurrent TIA and2.5%(3/118)hadcardiovascularevents at90days[18].

Johnston SC et al.short-term prognosis after emergency department diagnosisof TIA" showed strokes occurred in 180(10.5%) patients out of 1707 patients within 90days of TIA presentationand almost half ofstrokes occurred infirst two days. Anadverse event including stroke, cardiovascular hospitalization, death or recurrent TIAoccurredin428patients(25.1%)inthe90daysaftertheTIA.Morethan50%ofadverseeventsoccurredwithinthefirst4days[19].

In the present study the protocol of urgent evaluation and early treatment of TIA/MISis implemented. It showed that during follow up in 90 days none had completed stroke;4.65%(2/43)hadrecurrentTIAandnonehadcardiovascularadverseeventsordeath.Innextfollow up from 90daysto1year;2.32%(1/43) haddeath.

AccordingtoABCD2scoretherewere10(23.25%)patientswithhigh- r i s k TIA/MIS but none developed stroke and only 2 out of 10 patients experienced recurrentTIA/MISwithin 90 days. This suggests that urgent evaluation and early initiation oftreatmentinpatientswithcardiovasculareventsanddeath.The good point of this study was 24 hours accessible clinic, early enrollment ofpatientswithin24hoursofonsetofsymptomsandurgentevaluationandstartingappropriatetreatmentimmediatelyandsurvey;patientswhopresentedafter24hoursarenotincluded,samplesizeissmallandlackofDWMRI.

SUMMARY AND CONCLUSION:

- Theresults ofour prospectivestudy showedthatrapidevaluationand earlyinitiationoftreatmentforTIA/MIShelpssignificantlytoreducetheriskofcompletedstroke andothercardiovasculareventsanddeathinfirstthreemonths.

- Symptoms of TIA are frequently ignored by patient or under diagnosed and notprioritizedunderemergency by doctors.

- OurresultssupportthedatafromstudiesSOS-TIAfromParisandexpressfromU.K. that it is feasible and effective in reducing the cost of therapy and preventingrisk of stroke by more than 50% byproviding 24 hours availability of clinicalevaluation comprehensive investigations and intense treatment for patient withTIA/MIS.

- ItdoesestablishthefactthatTIA/MISshouldbetreatedastruemedicalemergencies. Workup of TIA/MIS patients should not be done in days but withinhoursafter onsetofsymptoms.

- Through public education and development of TIA clinics with implementation ofsecondarypreventivestrategies,theburdenandcostofstrokecanbesubstantiallyreduced.

- It is recommended to study larger number with longer period of follow up havebetterinformation.

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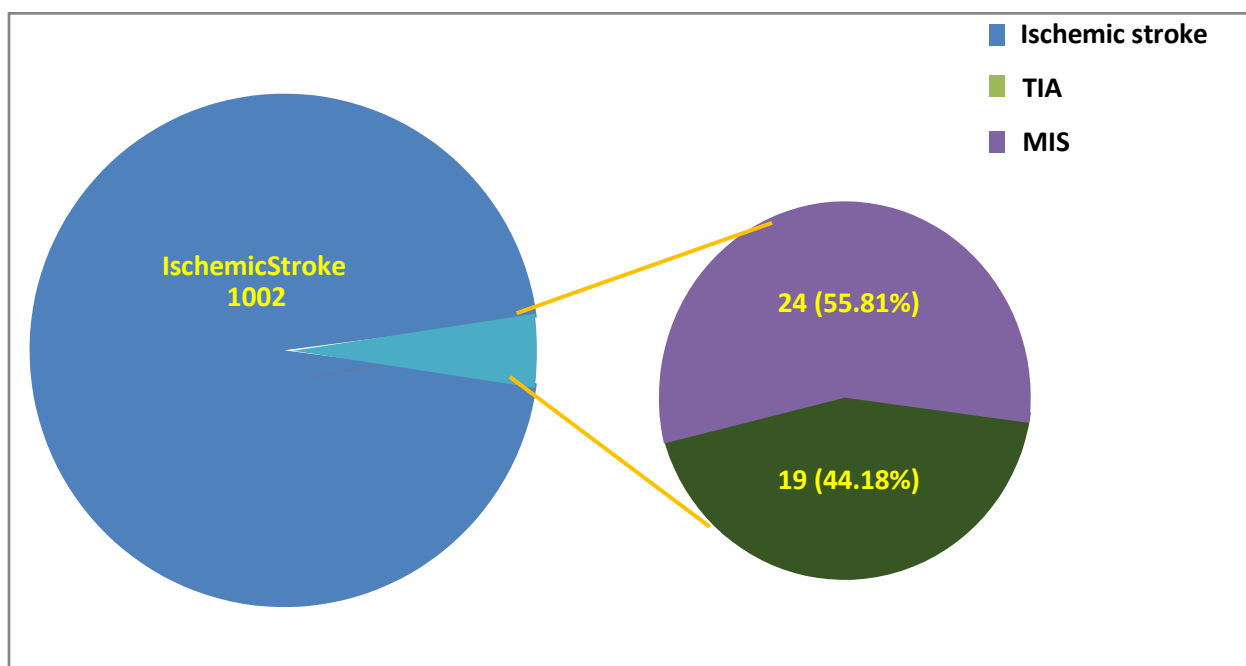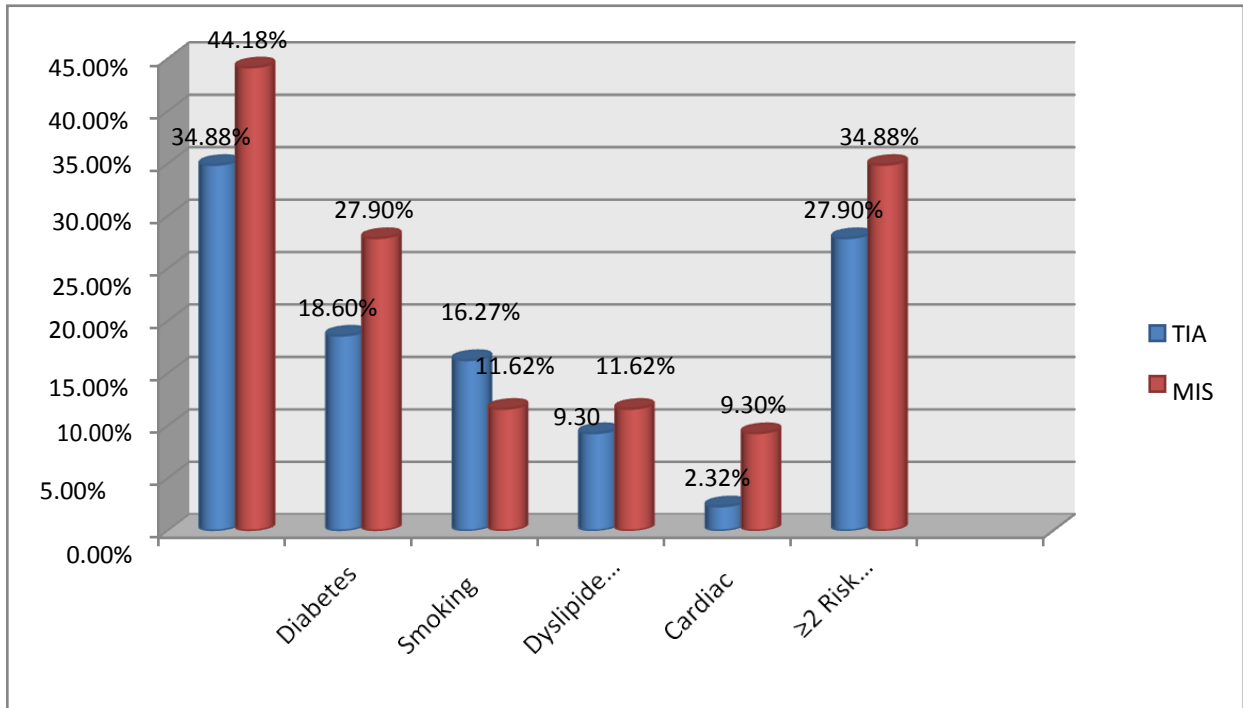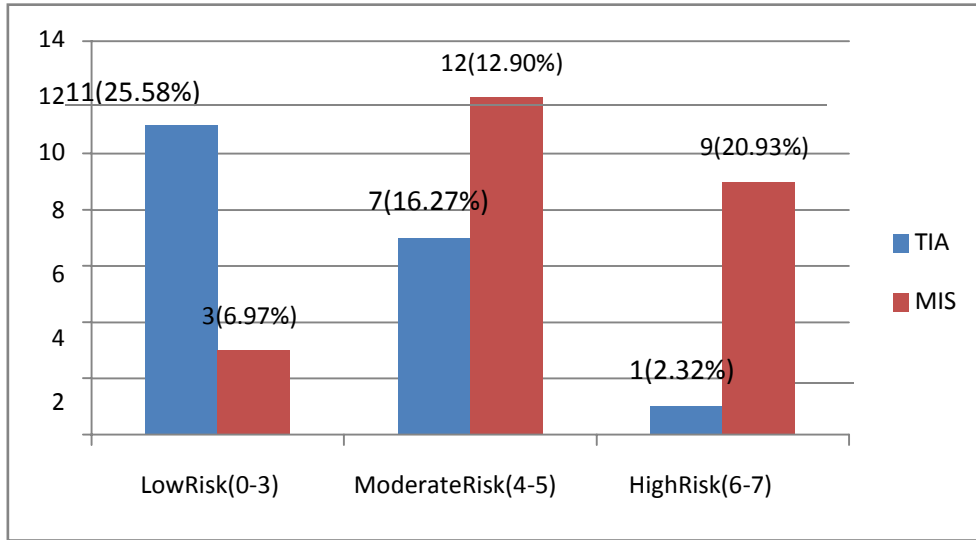
FIGURES AND TABLES

Figure1.TotalPatients

Figure2.RiskFactors in TIAand MISgroup

Figure3.RiskstratificationbyABCD2score inTIAandMIS group

Table1.Age distributionofpatients

Ageinyears	No. ofpatients	%
30-40	4	9.3
41-580	8	18.6
51-60	13	30.2
61-70	12	27.9

Table2.Genderdistributionofpatients

Gender	No. ofpatients	%
Male	31	72.1
Female	12	27.9
Total	43	100.0

Table3. Outcomeofstudy

Outcome	90Days				90daysto1year				Total	
	TIA		MIS		TIA		MIS			
	No.	%	No.	%	No.	%	No.	%	No.	%
Completed stroke	0		0		1	2.32	0		1	2.32
Recurrent TIA/MIS	1	2.32	1	2.32			0		2	4.65
Coronary arterydisease	0		0		0		1	2.32	1	2.32
Death	0		0		0		1	2.32	1	2.32