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Research Article

Knowledge of Physicians Regarding Transient Ischemic Attack in a Resource Poor Country

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Abstract

Background: Transient ischemic attacks (TIA) result in strokes in around 5- 11% of patients; 50% of these events happen in the first 48 hours. Two thirds of the burden of stroke is borne by low and middle income countries. This study assesses knowledge regarding TIA diagnosis and management among physicians in Pakistan.

Methods: Participants were selected through purposive sampling via available databases. Participants included primary care physicians, emergency room physicians, internists and neurologists. The survey was conducted electronically through a website that stayed on line for 8 months with weekly reminders sent to non-responders. Questionnaires were mailed to non-responders. Case based scenarios tested clinical recognition, triage skills, investigations and management regarding TIA on a graded Likert's Scale.

Results: 200 physicians out of 956invited to the study responded to the questionnaire (response rate of 21%). 79.8% physicians rightly diagnosed the given clinical scenario as TIA while39% thought it was also depression. 33% did not order an EKG and 32% did not agree with neuro imaging. 63% agreed with using Aspirin. 30%of the participants recommended futile and/or dangerous treatment modalities like antidepressants, steroids, and neuro protective agents. Participants who saw>10 TIAs a year fared better than those who saw <10.

Conclusion: Although recognition of the symptoms and risk factors associated with TIA is excellent, there is still considerable room for improvement in triage, management and investigation. Use of steroids, mannitol, B12 shots and neuro protective agents is either dangerous or futile and these incur avoidable patient related morbidity and cost.

Keywords: Transient Ischemic Attack; Developing Country; Knowledge and Management; Prevention

Background

Non-communicable diseases (NCDs) account for more deaths each year than all other causes combined [1]. Global deaths related to stroke alone are projected to increase from 4.5 million in 1990 to 7.7 million in 2020 [2]. Epidemiological data suggest that the burden of disease due to stroke is shifting towards developing countries [3]. A community based study [3] from an urban slum of Pakistan demonstrated an alarmingly high life-time prevalence of cerebrovascular diseases. It observed that 21.8% of those over 35 years of age had a cerebrovascular event. TIA alone was reported in 9.7% of community dwelling subjects.

TIAs proceed up to 23% of strokes, 17% of which occur the same day and 9% the day before. In fact, the immediate risk of stroke after an episode TIA is around 10% in the first 90 days, 50% of which is in the first 48 hours [4, 5]. This would suggest that rapid intervention following a TIA may assist in stroke prevention. Individual risk after an episode of TIA can be predicted by clinical triage tools like ABCD^2 scores and minimized by early diagnosis, testing and intervention [6]. However, nearly 50% of patients with TIA leave the Emergency Department without risk stratification or appropriate pharmacotherapy [7]. Up to 20% of patients with TIA are managed on an outpatient basis and remain under treated and under investigated [7].

Although there has been an increase in the clinical knowledge of physicians, there is still considerable unawareness regarding the best evidence based practices for diagnosing and managing TIA. This study aims to identify and explore those gaps that exist in developing countries.

Methods

The study is a cross sectional national survey that was conducted through an online questionnaire on physicians who serve as first point of medical contact for patients with CVA i.e. in the emergency room, walk in clinics or at a trained neurologist's service. There was an alternative option of conventional mail via self-addressed prepaid postal envelope for those who did not respond via email. The survey was administered, conducted and monitored by the Neurovascular Section, Department of Medicine at the Aga Khan University Hospital.

Participant selection criteria

Participants were selected through purposive sampling. The databases of the Pakistan Society of Neurology, Pakistan Endocrine

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Society, College of Family Medicine and Emergency Medicine Pakistan and Aga Khan University were accessed for registered physicians who provided first level care as well as those who were responsible of seeing patients with stroke risk factors like diabetes and hypertension and may have TIA present to their practice.

Questionnaire

The survey was conducted by a self-administered standardized questionnaire in English and took 5-7 minutes to complete.

The content of the questionnaire was divided into two sections. The first section comprised of 17 questions regarding physician demographics and practice. The second section consisted of 13 questions and was subdivided into two parts: Part one was a case-based scenario while part two tested basic knowledge of symptomatology and triage of the TIA patients. This section was used to assess identification, management and triage of TIA patients.

The case scenario described in detail the age, sex, co morbidities, clinical signs and neurological symptoms of a typical TIA patient. Options were provided in a fixed sequence on a Likert's scale. For each case scenario, physicians were asked to indicate their initial reaction in the specific situation from the given options. More than one answer was allowed to some questions.

Questionnaire content standardization

The case scenarios were constructed by the study group, critically reviewed by an experienced general practitioner and a clinical neurologist, both of which were not participants in the study. A pilot test was performed with 25 physicians for assessing acceptability of the questionnaire and correct understanding of the case vignettes. Results of the pilot test were not included in the final analysis.

Data collection

An email based survey was conducted and monitored. The questionnaire was delivered to them via surveymonkey.com. The web address was monitored for the period of 8 months waiting for the responses with periodic weekly reminders to the participants who were yet to respond. Physicians who did not reply to the emails after repeated reminders were mailed the copy of questionnaire and asked to fill it. No participant was provided with financial compensation although all the physicians were provided with Continuous Medical Education (CME) material on TIA as compensation for their time at the end of the survey.

Ethical review and informed consent

This study was approved by the Aga Khan University Ethical Review Committee (ERC Approval Number 1893-Med-ERC-11). Formal consent was sought from participating physicians prior to the beginning of the questionnaire.

Data management and analysis

Double Data entry was performed on Statistical Package for Social Sciences version 19.0 (SPSS Inc, Chicago, IL, USA). The mean and standard deviation of continuous variables such as age, year of experience was calculated. Proportions were reported for categorical variables such as gender, qualification and area and field of practice. The proportions of correct and incorrect responses to all questions related to knowledge and attitudes were calculated. The responses that were collected on Likert's scale were divided into 3 groups: "agree" (for agree and strongly agree), "disagree" for (disagree and strongly disagree) and "not sure". A comparison was also made among physicians who saw fewer than 10 TIA patients a year and equal to or more than 10 TIA patients a year using a chi square test. A p-value of <.05 was considered significant.

Results

Participating physician profiles

Majority of the physicians (73%) who participated in the study were male. 69% of the participants were general physicians followed by emergency medicine physicians (11.5%). Approximately half of the physicians (51%) were affiliated with academic institutions. 84% of the respondents were practicing in a capital city (provincial or federal). 63% of these physicians saw 10or fewer TIA patients annually (Table 1).

Clinical recognition of TIA

In response to the clinical scenario, 80% were able to diagnose TIA correctly. However, due to overlapping responses many

Table 1: Demographic information of participants.

	n(%)
Age	
24-34	60 (30)
35-44	65 (32)
45-54	48 (24)
55-65	20 (10)
>65	6(3)
Gender	
Male	146(73.0)
Female	54 (27.0)
Practice	
General physicians	138 (69.0)
Emergency Physicians	23 (11.5)
Neurologist	8 (4.0)
others	31 (15.5)
Nature of Clinical Practice	
Solo Practice	86 (43.4)
Institutional Practice	101 (51.0)
Solo and Institutional Practice	8 (4.0)
Institutional Research Practice	1 (0.5)
Nature of job	
Academic	112 (56.6)
Nonacademic	86 (43.4)
Postgraduate training	
Yes	141 (70.5)
No	59 (29.5)
Postgraduate training < 5 years ago	
<5 years back	100(50.0)
>5 years back	53 (26.5)
Type of postgraduate training	
Diploma	79 (52.0)
Fellowship	51 (34.0)
Current fellowship trainee	11 (7.3)
Diploma + fellowship	9 (6.0)
Area of practice	
Capital city (pop >100,000)	167 (84.3)
Small city (pop<100,000)	17 (8.6)
Large rural centre (pop >10,000)	10(5.1)
Small rural centre (pop <10,000)	4 (2.0)
Registered Practitioners	
Yes	177 (88.5)
No	23 (11.5)

Table 2: Response to a case scenario of transient ischemic attack.

	Response Rate (%)
Diagnosis	
TIA	79.8
Heart attack	29.5
Depression	40.0
Important aspects on history	
Hypertension	82.0
Diabetes mellitus	75.0
Ischemic heart disease	70.0
Congestive heart failure	49.0
Chronic kidney disease	45.0
Oral tobacco	62.0
Smoking	73.0
Stress and depression	62.0
Prior history of stroke/Transient ischemic attack	78.0
Family history of stroke/Transient ischemic attack	80.0
Current use of aspirin	59.0
Sedentary Lifestyle	74.0
Obesity	76.0

physicians selected more than one option and 29% also diagnosed it as a heart attack while 40% believed that the patient in the scenario was suffering from depression. (Table 2)

Choice of investigations

Among diagnostic evaluations, 33% disagreed with ordering an Electrocardiogram (EKG) and32% disagreed with neuro imaging. Among those who agreed with neuro imaging, 50% chose a plain Computed tomography (CT) brain, 42% suggested a CT Brain with contrast while36% recommended anon-contrast Magnetic Resonance Imaging (MRI) brain. On the contrary some 36% suggested an MRI brain with contrast while 33% also advised a cerebral angiogram for the patient in the scenario. Only 40% physicians recommended a non-contrast MRI Brain with Diffusion Weighted Images and Magnetic Resonance Angiogram (MRA) (Table 3).

Therapy

63% participants recommended prescribing Aspirin 75 mg daily while 33% did not feel the need to do so. For the patient given in the scenario, 60% physicians would prescribe a stat in and 49% would use an anti-hypertensive.

Also recommended by a significant proportion of physicians were futile or dangerous treatment modalities like antidepressants (29%), vitamin B12 injections (28%), mannitol (21%), hydergeine (21%), dexamethasone (20%), and citicholine (18%) (Table 3).

Triage practices

After diagnosis, 47% of the physicians would have directed the patient described in the case to an emergency care setting, 42% participants disagreed with urgent referral entirely while 29% would have reassured the patient and sent him home. 33% physician's disagreed with referral to a specialist (Table 3).

Table 3: Referral pattern and choice of medications in a TIA patient*.

	Agree %	Disagree %
Referral		
Reassure and send home	29	3.3
Urgent referral to ED	47	42.4
Referral to a specialist	60	33.3
Choice of Neuroimaging		
CT Brain without contrast	50	39
CT Brain with contrast	42	47
MRI Brain without contrast	36	45
MRI Brain with contrast	36	48
MRI brain with DWI	28	52
MRI brain with DWI and MRA	40	42
Cerebral Angiography	33	47.5
Medications		
Aspirin	63	33
Antihypertensive	49	42
Statin	60	32
Mannitol	21	63
Dexamethasone	20	64
Antidepressants	29.5	56
Parenteral Vitamin B12	28	59
Citacholine	18	62
Hydergine	21	63
Intravenous fluids	25	59

*the remaining participants were not sure
CT: Computerized Tomography
DWI: Diffusion Weighted Imaging
MRI: Magnetic Resonance Imaging
MRA: Magnetic Resonance Angiography

Risk and threat assessment

The risk of recurrence within the first 48 hours after an initial episode of TIA was believed to be greater than 15% by 21% of the participants. 63% believed the risk was less than 15% while 16% did not feel there were any chances of recurrence within the first 48 hours.

Knowledge about the predictors of TIA recurrence showed that 86% of physicians identified hypertension as a predictor, 79% of physicians identified age while 77% believed DM was a predictor. The duration of symptoms was considered significant by 52% of physicians when estimating the risk of recurrent stroke. Among the symptoms, hemiplegia was chosen by 56% as a predictor for TIA.

Experience and exposure to TIA

Physicians who saw greater than 10 TIA patients per year fared significantly better (p value < 0.05) at diagnostics, treatment and triage of TIA patients compared to those who did not (Table 4).

Discussion

A significant majority of the health care providers (80%) were able to correctly identify the condition presented as a TIA. Amongst those who did not, most labeled it as depression. Although not excusable, this is a reflection of the high frequency of depression encountered in clinical practice in Pakistan [8, 9]. An extremely low psychiatrist to population (adult) ratio, around1: 320,000 in Karachi for example, results in physicians of all specialties regularly observing depression in a course of a busy practice [10, 11].

In accordance with the new definition of TIA, most physicians rightly identified the need of a radiographic imaging modality to diagnose the condition accurately. In a national study carried out in the US evaluating ER visits for TIA, CT scan were performed on 56%

Table 4: Analysis by experience of provision of care to TIA patients.

	Physicians who see <10 TIA patients annually N(%)	Physicians who see >10 TIA patients annually N (%)	p value
Clinical Recognition			
Heart attack	45 (41)	15 (22)	**<.01a**
Depression	62 (56)	28 (41)	**0.05a**
Triage Practice			
Reassure and send home	47 (42)	12 (17)	**0.00a**
Reassure and medical prescription	50 (44)	16 (23)	**0.00a**
Diagnostic Tests			
CT contrast	59 (50)	49 (28)	**0.00a**
Echocardiography	71 (60)	53 (77)	**0.01a**
Carotid Doppler US	53 (46)	49 (71)	**0.00a**
EKG for all TIA patients	71 (61)	53 (76)	**0.03a**
Treatment Options			
Mannitol	47 (42)	20 (29)	**0.07**

[a]Statistically significant with p values <0.05.

and MRI on less than 5% of the patients respectively [12]. Similarly, in a study carried out in Ontario, Canada, 58% patients underwent CT scanning and 3% were evaluated using MRI on presenting to the ER with TIA [13]. These figures would suggest our findings to be comparable with those found in the West. However in actual practice, as demonstrated by a study carried out in a tertiary care hospital in Karachi, Pakistan [14], the use of neuro imaging in our part of the world has remained relatively unchanged which indicates the need to increase awareness amongst physicians about the importance of these modalities as diagnostic tools for TIAs.

Regarding choice of diagnostic modality, the study also showed relative underutilization of MRI with DWI and MRA as most physicians opted to use CT and MRI with or without contrast. Although it is ideal to examine cerebral vasculature along with the brain parenchyma; it may have been financial considerations that prompted these pragmatic decisions. CT or MRI however, are unable to diagnose intracranial stenosis, a condition with a 2 year recurrent stroke rate of 24%, which is prevalent in the region [15]. Hence identifying TIA (whose mechanism is ICAD) via MRA, may be useful in preventing strokes through institution of robust secondary prevention [16-20].

A substantial number of physicians felt that an EKG was not necessary whilst evaluating a patient. This is an erroneous practice contradicting the guidelines for managing TIA and numerous studies that indicate the necessity of performing an EKG for its ability to identify those who are at a higher risk of short term cardiovascular events along with the underlying etiology of the index event (e.g. a trial fibrillation) [21-25].

A large number of physicians (73%) agreed on giving aspirin to patients undergoing a TIA. Guidelines endorse the use of aspirin alone or in combination with another anti platelet agent to help decrease the risk of stroke post TIA [21, 26-28]. These numbers would also indicate an increasing trend in the use of aspirin for treating TIA in this part of the world as a study carried out in a tertiary care hospital in Pakistan showed that only 42% of the patients received aspirin [14]. The use of anti-hypertensive medications and statins still needs further encouragement.

This study also revealed that unfortunately it was common practice amongst physicians to over utilize medications not indicated for treating TIA- some of which like dexamethasone have the potential of doing more harm than good to the patient. Use of these unnecessary medications adds to the already high cost of treating cerebrovascular diseases, which according to a study conducted in 2003 has increased 3 to 14 times per patient [29, 30].

Most physicians displayed a sound understanding about the risk factors that are relevant to TIA patients, but perhaps not as systematically as when using the $ABCD^2$ score. More than half of these physicians, in accordance with numerous studies that highlight the effectiveness of $ABCD^2$ as a triaging tool [31-33], rightly chose age, HTN, diabetes, long duration of symptoms and patients presenting with hemiplegia as factors associated with high risk of stroke following a TIA. However, there were still a small number of physicians who could not identify the factors that constitute the $ABCD^2$ score emphasizing the need to further increase awareness amongst clinical practitioners in this part of the world.

The strength of this study lies in the inclusion of physicians ranging from general practitioners to neurologists, hence providing a snapshot of TIA management at different tiers of the health care system. This allows us to identify the knowledge lacking at each level. In addition , the questionnaire was designed such that it did not allow respondents to review their answers once they had entered them; any possibility of the physicians rechecking their answers after reading up the relevant material from another source, was eliminated.

Our major limitation was the overall poor response rate 21% (200/956), despite the site being on line for 8 months, repeated reminders, supplemental mailings and offers of CME supplements. This selection bias would favor relatively motivated physicians who were intent on CME and thus overestimate the general knowledge and alignment to practice based guidelines. On the other hand, although it may have resulted in a better response rate, a financial incentive for participation may have biased our study results as physicians would have attempted to provide 'ideal answers'. There was however, no substantial difference in profiles from our database review between those who responded and those who did not, hence these findings although limited are still useful.

Conclusion

Clinical recognition, administration of aspirin, use of neuro imaging regarding TIA were encouraging while EKGs were

underutilized and patients were often given other futile, expensive or dangerous medications. These prescribing behaviors in particular require special attention and should be the focus of future educational interventions. In our resource scant region with little or no mental health services and an unusually high burden of depression, diagnosing TIA as depression equivalent may be another area of focused feedback. In addition, future TIA trials or educational efforts in this region should necessarily include, respect and enable these frontline providers, as neurologists are not the first stop for TIA patients and aren't always invoked in the critical post TIA "window of opportunity".

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