Clinical Audit of Patients with Cerebrovascular Accident and Transient Ischemic Attack in Our Lady of Lourdes Hospital Drogheda, Ireland

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Abstract

Background: Stroke is a major health problem and is one of leading causes of morbidity and mortality.

Methods: A clinical audit comprising retrospective chart review of 101 patients randomly selected from admission register in Our Lady of Lourdes Hospital Drogheda, Ireland, was done during the first quarter of 2009. Keeping in view the recommendations, in this audit the following areas were evaluated: type of event, time of event and arrival to hospital, thrombolytic therapy, past medical history, investigations, smoking history, utilization of multidisciplinary services (physiotherapy and occupational therapy, speech and language therapy), medications, referral to GP, carotid pathology, and outcome.

Results: Of the 101 patients, 43 (42.5%) were males and 58 (57.4%) were females. 47.5% (48/101) had TIA while 52.5% (53/101) had CVA. Of the total patients, 62.8% males and 56.8% females were hypertensive and 48.8% of males and 36.2% of females had hypercholesterolemia. Of the total number of patients, 23% of males and 15.5% of females were smokers. Utilization of different multidisciplinary services for males and females was following: physical therapy (46.5% and 45.8%);occupational therapy (11.6% and 15.3%); speech and language therapy (13.9% and 22%). Of all the patients 5% died in the hospital, Fatima Jinnah Medical College, Lahore

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77.2% were discharged home and 17.8% were sent to Nursing home for long term care.

Conclusion: The commonest risk factor for CVA / TIA is hypertension followed by hypercholesterolemia. Smoke cessation advice should be given to all at risk.

Keywords: CVA, hypertension, disability and mortality.

Introduction

Stroke or cerebrovascular accident (CVA) is the third most common cause of death worldwide and the most cause of disability for those at home. It causes significant strain on the health resources. After an episode of stroke, 53% patients become physically dependent on others at 6 months, 12% need institutional care at year 1[1].

Globally 15 million suffer from Stroke every year, 5 million die and 5 million are left with permanent disability.[2] As per the American Stroke Association, of all the patients admitted with stroke in USA Hospitals, 87% had an ischemic event, 10% had intracerebral bleed and 3% had subarachnoid hemorrhage.[3]

Keeping in view the importance of this disease having significant morbidity and mortality, with long term implications on human life and society, we did a clinical audit of patients admitted with transient ischemic attack (TIA) or CVA in Lady of Lourdes Hospital, Drogheda.

Audit Criteria

The audit was carried out on the basis of Scottish Intercollegiate Guidelines Network (SIGN) guidelines 'management of patients with stroke or TIA; Assessment, investigation, immediate management and secondary prevention 2008'.

Implementation of national guidelines is the responsibility of each hospital and is an essential part of clinical governance. It is acknowledged that every hospital cannot implement every guideline on publication, but mechanism should be in place to ensure that the care provided is reviewed against the guideline recommendations and the reason for any difference assessed and where appropriate addressed. Keeping in view the recommendation in this audit the following areas were

evaluated: type of event, time of event and arrival to hospital, thrombolytic therapy, past medical history, investigations, smoking history, utilization of multidisciplinary services (physiotherapy and occupational therapy, speech and language therapy), medications, referral to GP, carotid pathology, and outcome.

Methodology

A retrospective chart review was done of 101 patients randomly selected from admission in Our Lady of Lourdes Hospital during the first quarter of 2009. AII documents including referral letters, A/E notes, admission notes, investigation results, radiology results, discharge prescriptions, OT/PT and SALT notes, discharge letters and follow up OPD results were reviewed by the audit team.

Results

The results were as follows:

Gender

Total number of patients was 101 out of which 43 were males and 58 were females.

Age

The average age for males was 73.1 years (38 – 93) and for females was 74.5 (33 – 99) and over all median age was 74 years.
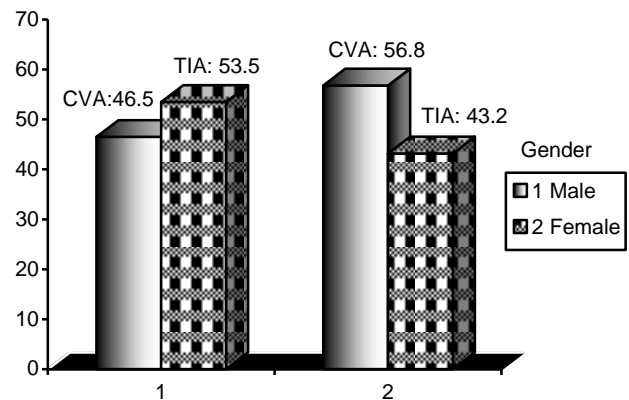

Fig. 1: Percentage of CVA and TIA in Males and Females.

Type of Event

Of the male patients 46.5% had CVA and 53.5% had TIA (Figure 1). CT brain findings showed that 58.1%
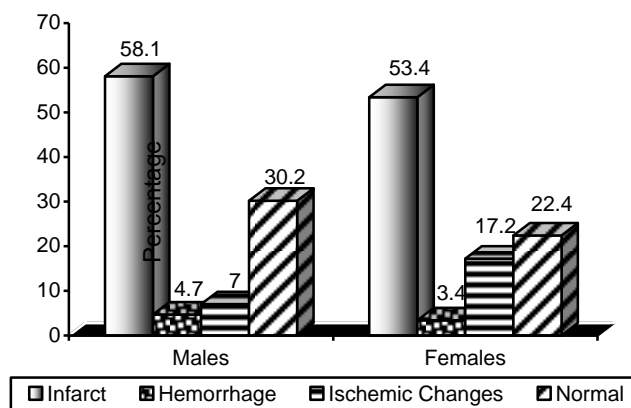

Fig. 2: CT Brain findings in Males and Females.

had infarcts, 4.7% had hemorrhages, 7% had Ischemic changes and 30.2% had a normal CT Brain. Of the female patients 56.8% had a CVA, 43.1% had TIA. CT bran findings showed that 53.4% had infarcts, 3.4% had hemorrhages, 22.4% had normal CT, 17.2% ischemic changes. 1.7% had no CT brain (Figure 2).

Time of Event and Arrival to Hospital

The average time interval between having the event and reaching to hospital was 5 hours.

Thrombolytic Therapy

None of the patients received thrombolytic therapy.

Past Medical History

a. Hypertension

Of the total patients, 62.8% males and 56.8% females were hypertensive.

b. Diabetes Mellitus

Of the total patients, 20.9% of males and 12.06% of females were diabetic.

c. Hypercholesterolemia

Of the total sample, 48.8% of males and 36.2% of females had hypercholesterolemia.

d. Atrial Fibrillation.

Of the total patients, 37.2% of males and 17.24% of females had atrial fibrillation.

Investigations

a. CT Brain

Out of the total number of patients, 98.01% had a CT Brain done and 1.9% had no CT brain done.

b. Carotid Doppler

Of the total patients, 67% of males and 52.5% of females had carotid Doppler done.

c. Echocardiogram

Of the total patients, 72% of males and 55.9% of females had an echocardiogram done.

d. Holter Monitoring

Of the total patients, 41% of the males and 44.1% of females had holter monitoring done.

e. Fasting Lipid Profile

Of the total patients, 74.4% of males and 69.5% of females had fasting lipid profile done.

Smoking History

Of the total number of patients, 23% of males were smokers and 28% were ex-smokers, 37.2% were non-smokers, and in 11.6% no smoking history was taken. Of the female patients 15.5% were smokers, 17.24% were ex-smokers, 34.4% were non-smokers and in 32.7% no smoking history was taken.

Medications

Of male patients, 60.4% were already on aspirin and aspirin was added to 16.3%, 48.8% were already on statins and they were added in 30.2%. In females, 59.3% were already on aspirin and it was added in 15.3%, 50.8% were already on statins and they were added in 22%, 54.2% were already on anti-hypertensives and they were added in 11.9%.

Utilization of Multidisciplinary Services

Of the total number of patients the utilization of multidisciplinary services was in males (PT 46.5%, OT 11.6%, SALT 13.9%) and females (PT 45.8%, OT 15.3%, SALT 22%).

Referral to GP

All patients who were discharged from the hospital had appropriate discharge letters sent to the GP's with all relevant details of the stroke with adequate follow up plan.

Carotid Pathology

Of all the patients 11.6% of males and 8.6% of females had significant carotid pathology and appropriate referral to vascular surgery was done in all cases.

Outcomes

Of all the patients admitted with TIA / CVA 4.95% died in the hospital, 77.2% were discharged home and 17.85% were sent to Nursing home for long term care. And 16% had PEG tube inserted.

Discussion

Stroke is a highly prevalent manifestation of cardiovascular disease; with its prevalence varying from 8% for TIA and 7% for CVA.[4] Pathogenesis of stroke is multifactorial with major risk factors being hypertension, atrial fibrillation, dyslipidemia, diabetes mellitus, hypercholesterolemia and smoking.[5,6] Non-Modifiable risk factors include gender and age. Basic pathology of CVA is the injurious interaction between the newly formed arterial thrombus and atherosclerotic plaque whose rupture can trigger a cascade releasing inflammatory factors, occlusion of the arterial lumen locally or dislodgement of the thrombus from its original site and its lodgment at a distal site causing ischemia.[7] Platelet adhesion is also altered in 1 – 4% of the individuals due to an alteration of vWF binding to the subendothelial surface causing coagulation disorders.[8] Age above 40 years accounts for a major risk factor, as overall prevalence was 3 per 1000 but age specific prevalence went from 2.0 per 1000 in patients aged 40 – 49 to 10.0 per 1000 in patients with ages 80 and above and male to female prevalence being 3.44 : 2.41 per 1000.[9] Age of greater than 80 years plays an important role in post stroke management as it is associated with higher rate of mortality.[10] Average age of our participants was 73.1 years for males and 74.5 years for female patients thus putting at a greater risk for CVA and TIA. More female subjects experienced CVA (56.8%) vs. male subjects who had a greater instance of TIA (53.5%).

Similar outcome was found in studies that looked at female gender suffering from diabetes. Researchers found that 29.5% of women as compared to 15.3% of

men were affected with a thromboembolic infarction episode.[11] So, more females were at risk for developing a fatal outcome especially when risk factor of diabetes was incorporated. Although in our studies more males (20.9%) had diabetes as co-morbidity as compared to 12.6% of the females. Outcome of cardiovascular disease in Australia showed a poorer health outcome for females than males in the presence of AF but a relatively preserved cardiac function. Higher death rates and complications like higher risk of bleeding with anticoagulant therapy were attributed to an ST-segment elevation in these patients [(12)]. However in a cross sectional study, an increase in CVA was found in males with hypertension as compared to females taking antihypertensive drugs. More males (62.8%) then females (56.8%) were diagnosed with hypertension as a co-morbidity in our study thus exposing males to an ischemic episode which is a similar to findings by other researchers.[13]

Smoking is a major modifiable risk factor in younger pateints.[5,6] In older patients with mean age of 58.6 years and a follow up of 13.1 years, 89 cerebral infarctions were associated with smokers (n = 391; P ≥ 0.6).[14] Combined number of smokers and ex-smokers was more than non-smokers; males (smokers: non-smokers; 51%: 37.2%) vs. females (smokers: non-smokers; 32.74%:34.4%). Thus males showed a higher correlation of disease with smoking history. Dyslipidemias are also an important risk factor as they are associated with an increased risk of stroke.[6] High levels of cholesterol were observed in 48.8% of males and 36.2% of femles; this being associated with CVA and TIA. High plasma apo E levels are also related to an increase in cardiovascular pathology leading to stroke; 1.58 fold increase in stroke and 1.47 fold increase in mortality.[15]

Premorbid use of antiplatelet, antihyperlipidemic and antihypertensive drugs are associated with an early return of function within 10 days with statin use having an OR = 0.37 and a combination therapy having an OR = 0.37.[16] Thus, statins are considered mainstay of therapy among patients with CVA. They are shown to prevent the occurrence of first or recurrent episodes of CVA.[17] As more females are prone to CVA, more female patients were taking statins; 50.8% as compared to 48.8% of the male patients. After their first episode more males; 30.2% had statins added to their drug regimen as compared to 22% of the female patients. Aspirin is the most commonly used over the counter drug for prophylaxis of CVA and TIA. At the dose of 81 or 325 mg, post menopausal women were

shown to slightly lower all cause (0.86, p = 0.04) and cardiovascular mortality (0.75, p = 0.01) as compared to the control group.[18] Most of our male subjects; 60.4% were already using aspirin before coming to us whereas for 16.3% it was added to their drug regimen as compared to 59.3% females who were already on aspirin and 15.3% newly added patients to this regimen. The role of aspirin in prevention of stroke is proven due to its anti-platelet activity.[19] Another study supports the role of aspirin in primary prevention of stroke especially when used in combination with a statin.[20]

Various investigations are used for the workup of CVA / TIA, including a CT brain, Fasting lipid profile, Echocardiography, Holter monitoring and Carotid doppler. Transesophagealechocardiography (TEE) can be very helpful for diagnosis of valvular abnormalities and thrombus. ECG and holter monitoring are helpful in presence of arrhythmia.[21] Holter recordings were also found to be useful in patients with history of cardiac disease, mean age of 73 years and who showed chronic AF (23%) and ventricular ectopic pathology (55%).[21,22] TEE and Holter accounted for higher costs than low cost ECG. They were performed in > 70% of cases and accounted for approximately 94% of total cardiovascular cost. CT scans are also widely used tool in assessing the specific pathology ranging from ischemic lesions (44.6%) and hemorrhagic lesions (29.6%).[22] Thus identification of lesions balanced with the cost of the procedure can guide physicians to a better management strategy.

Multiple rehabilitation services were utilized by nearly all of our patients including Physiotherapy, Occupational Therapy and Speech and Language Therapy Assessment (SALT). Thrombolytic drugs are another group which if administered within specific time can be useful in lowering morbidity and mortality. Among the stroke patients given IV tPA within 3 h, showed a favorable outcome in function among 52% of the survivors age of ≥ 80 years; although a 3 month outcome is better for younger counterparts.[23] Although none of our patients received any thrombolytic due to their mean arrival time being 5 hrs. Thus a timely arrival to the hospital with appropriate treatment can have a better effect on prognosis of the disease.

Mortality among patients with ischemic stroke or TIA after hospital discharges was found to be 6.8% in a 1 year follow up study; leading cause of death being cerebrovascular disease, pneumonia, followed by heart disease with 24.1%, 22.6% and 18.1% of the patients respectively.[24] In our study, group mortality was also

low at 5% with discharge rate being 77.2%. Thus with this high discharge rate and keeping in mind all the factors discussed above patients should avoid modifiable risk factors that have effects on their disease, take their medicines regularly and should be more aware of their symptoms and arrival time should be minimized so that effective thrombolytic therapy could be administered.

Conclusion

After reviewing the above data we concluded that:
1. The commonest risk factor for CVA / TIA is hypertension followed by hypercholesterolemia. Patients having these risk factors need aggressive treatment along with life style change advice.
2. Arrangements for thrombolysis should be made in the hospital.
3. Transfer time to the hospital should be shortened.
4. A public awareness campaign should be launched in order to inform people to reduce the risk factors, recognize the symptoms and quick access to medical services.
5. New performas should be designed and used by the admitting doctors, covering all areas including a detailed past medical, family history, medications, social and personal history and detailed clinical examination.
6. On discharge all co-existing diseases and risk factors should be aggressively treated.
7. Smoke cessation advice should be given to all at risk.
8. Medical record keeping should be improved.
9. Multidisciplinary Services like PT / OT / SALT services should be improved.
10. Fasting blood lipids should be routinely done on all patients with CVA / TIA.
11. The overall quality of service provided to patients with CVA / TIA is quite good, but can still be improved and facilities well utilized, if set protocols are enforced incorporating the above mentioned recommendations.

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