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Stroke Performance Indicators at Tertiary Care Hospital IGMC Shimla

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Abstract: In spite of widespread recommendation, clinical practice guidelines have had limited effect on changing physician behaviour. To study adherence to Stroke Performance Indicators in patients of acute Ischemic stroke in a Tertiary Care Hospital. Seven predefined performance measures as targets for stroke quality improvement were evaluated over a period of one year between July 2014 to June 2015: (1) rtPA use in patients who arrived with in 2 h from symptom onset; (2) antithrombotic medication use within 48 h of admission; (3) DVT prophylaxis within 48 h of admission for nonambulatory patients; (4) discharge use of antithrombotics; (5) discharge use of anticoagulation for atrial fibrillation; (6) treatment for LDL > 100 mg/dl and (7) counselling for smoking cessation.A total of 250 consecutive patients with acute stroke were screened in one year. 191 were ischemic stroke. A total of 58 patients arrived within 3 h from symptoms onset, 35 were eligible for intravenous thrombolysis and thrombolysed. 97.7% patients were discharged using antithrombotic medication. Antithrombotic medication within 48 h was used in 93.0% of the patients and deep vein thrombosis prophylaxis in 59.6%. Those who had atrial fibrillation 70.96 % of the eligible patients received anticoagulation. Only 96.9 of the eligible patients received statins. Counselling for smoking cessation was done in 91.7%.Knowledge and acceptance of guidelines do not necessarily imply guidelines adherence. There is need to ensure compliance with the stroke guidelines for better outcome of all patients.
Keywords: Stroke**;** antithrombotic medication; anticoagulation; Smoking

INTRODUCTION

A stroke, or cerebrovascular accident, is defined by abrupt onset of a neurologic deficit that is attributable to a focal vascular cause [1]. Stroke is no longer a disease of the developed world. Low and middle-income countries account for 85.5% of total stroke deaths worldwide [2]. Guidelines are continuously developed and updated in the developed world, but their practicality for use in developing regions is unrealistic [3]. Professional guidelines improve the delivery of evidence-based care; however, despite these guidelines, gaps between best evidence-based practice and actual practice persist [4]. In spite of widespread recommendation, clinical practice guidelines have had limited effect on changing physician behaviour. Get with the Guidelines- Stroke is the American Heart Association's collaborative performance improvement program, demonstrated to improve adherence to evidence-based care of patients hospitalized with stroke. The program was aimed to address the adherence gap by focusing on the redesign of hospital systems of care [5]. Several dimensions of care are included: acute treatment; prevention of recurrence; prevention and treatment of common medical complications; rehabilitation and patient education and counselling – cutting across multiple healthcare disciplines; providing measure sets applicable to all dimensions of care in the acute care hospital setting [6]. A key determinant that hampers broad application of GWTG-Stroke around the world is the diversity of healthcare economies. It could be difficult for nations spending substantially less in healthcare dollars to apply GWTG-Stroke standards. To examine whether GWTG Stroke is workable across nations with substantial disparities in health expenditures, we applied GWTG-Stroke to assess the quality of stroke care in Indian setting in our hospital i.e. I.G.M.C. Shimla. This study also sought to reveal room for improvement in our hospital current practices, forming the basis for future implementation of a national-based educational program such as the GWTG.

Patients and methods

This was hospital based one year cross-sectional, observational study which was carried out in Departments of Medicine and Neurology IGMC Shimla from July 2014 to June 2015. The inclusion criteria were Age >18 years, and CT head suggestive of acute ischemic stroke. All the patients presenting with stroke and meeting the eligibility criteria were assessed using preformed questionnaire. We compared the stroke treatment quality indicators assessed using questionnaire in our hospital to those published by the GWTG stroke program. Seven predefined performance measures selected by the GWTG stroke program as targets for stroke quality improvement were evaluated: (1) tissue Plasminogen activator use in patients who arrived 2 h from symptom onset; (2) antithrombotic

medication use within 48 h of admission; (3) deep vein thrombosis prophylaxis within 48 h of admission for non ambulatory patients; (4) discharge use of antithrombotic; (5) discharge use of anticoagulation for atrial fibrillation; (6) treatment for LDL > 100 mg/dl in patients; (7) counselling for smoking cessation.

RESULTS

Among 250 patients with stroke, 191 (76.4%) had ischaemic stroke. Among 191 patients with ischaemic stroke, 107 (56%) were males and 84 (44%) were females. The mean age of patients with stroke in our study was 61.91 years. Majority of the patients i.e. 54 (28.3%) were in the age group of 56-65 years. 150 (78.5%) cases belonged to rural area and 41 (21.5%) cases belonged to urban area. Only 58 (30.36%) out of 191 patients with ischaemic stroke arrived within 4.5 hours which was taken as window period for thrombolysis. Major cause of delay in arrival of our patients to hospital was unawareness which was present in 83 (43.5%) patients.

Among the various predisposing factors for stroke, hypertension and smoking were major preventable risk factors which were present in 104 (54.4%) and 92 (48.2%) patients respectively. Others were diabetes mellitus (32, 16.7%), Atrial fibrillation (28, 14.6%), previous stroke/ TIA (23, 12%), Known dyslipidemia (19, 10%), valvular heart disease (14, 7.3%), known heart failure (5, 2.6%) and peripheral vascular disease (4, 2.1%).

All of 58 patients who reached hospital within window period were subjected to imaging. The mean Door to CT time was 61.54 min (9-540 min). The majority of the patients i.e. 34 (60.7%) had door to CT time of ≤25 minutes. The mean NIHSS score was 15.16±9.69 (0-44). Out of 191 patients with ischaemic stroke 93 (48.7%) had score between 11-24. Among 58 patients with ischaemic stroke who reached hospital within window period, only 35 (60.3%) cases were eligible candidates for thrombolysis with rtPA and thrombolysed. 17 (48.6%) patients received IV rtPA within 3 hours of symptom onset. The mean door to needle time was 78.47±28.17 minutes with a range of 25-170 minutes. Median door to needle time was 72 minutes. Out of 35 patients who underwent thrombolysis, 11 (31.4%) patients had door to needle time of ≤ 60 minutes. 5 (14.3%) out of 35 thrombolysed patients had symptomatic intracranial haemorrhage and 1 (2.9%) patient had unknown complication and died within 2 hours post-thrombolysis. Most common cause of non-treatment with thrombolysis in our study was NIHSS < 5 which was present in 8 (34.9%) patients among 23 patients who arrived within window period but couldn't be thrombolysed.

Out of 191 patients with ischaemic stroke in our study, 5 (2.6%) patients died within 2 days of hospitalization. Among remaining 186 patients, 173 (93 %) patients received antithrombotic therapy by the end of hospital day 2. 87 (45.6%) patients out of 191 cases became ambulatory by the end of hospital day 2. However, 99 (51.8%) patients couldn't achieve ambulation by the end of hospital day 2 who were eligible for DVT prophylaxis. Out of these 99 patients, DVT prophylaxis was started in 59 (59.6%) patients by the end hospital day 2.

Dysphagia screening was done in 178 (93.2%) patients out of total 191 cases. 129 (97.7%) patients were given antiplatelets at discharge out of 132 eligible patients. Out of 31 patients who were eligible for anticoagulant therapy, 20 had non valvular AF, 6 had valvular AF and 5 patients had left ventricular / carotid thrombous. Anticoagulant drugs were given to 22 (70.96%) patients at discharge. Statins were given to 123 (96.9%) patients at discharge out of 127 eligible patients. 123 (98.4%) patients were given antihypertensive drugs at discharge out of 125 hypertensive patients. Out of 191 patients with ischaemic stroke, 92 were smokers and 72 were eligible cases. Counselling for smoking cessation was done in 66 (91.7%) patients.

DISCUSSION

Out of 191 patients, 76.4% patients had ischaemic stroke and 23.4% had haemorrhagic stroke. This is in concordance with the study by Banerjee *et al.* [7] and Hsieh et al who reported similar incidences [8]. Among 191 patients with ischaemic stroke, 56% were males and 44% were females. This is in concordance with study by Hsieh et al who reported 59.8% cases as males and 40.2% cases as females in ischaemic stroke in TSR in 2006-2008 [8].

The mean age of patients with stroke in our study was 61.91±14.43 years. This was consistent with the study by Sridharan *et al*. [9], however, Schwamm et al in their study in US reported 74 years as mean age among stroke patients [10]. It is believed that the average age of patients with stroke in developing countries is 15 years younger than that in developed countries which is clearly depicted in our study [11].

Study conducted by Sridharan *et al*. who in his study analyzed that, of the 541 validated first-ever strokes in Trivandrum, 79.6% occurred in the urban community and 20.4% occurred in the rural community [9]. The higher incidence among rural population in our study is because our state is largely a rural state with about 90% population residing in rural areas.

58 (30.36%) patients arrived within 4.5 hours which was taken as window period for thrombolysis. Only 26.2% of TSR patients with ischemic stroke arrived within 2 hours of stroke onset and in time for IV rt-PA treatment as shown by Fanh I Hsieh *et al*. in 2006-2008 [8].The study by de Carvalho et al reported 35.86% patients arrived within 2 hours of symptom

onset 2010 [5]. We have taken 3 hours as time to monitor as patients thrombolysed up to 4.5 hours in our study.

Major cause of delay in arrival of our patients to hospital was unawareness, unwillingness of attendants and local treatment. Long distance from hospital was cause of delay in 25.6% patients. According to the study by Dalal *et al.* 32.8% patients were cared at home or in nursing homes. This indicates that one out of every 3 patients with stroke are not accessing appropriate healthcare probably due to non-affordability, usage of alternative medicines, and difficulty in conveyance [12].

The mean Door to CT time was 61.54 min. The majority of the patient's i.e.60.7% had door to CT time of ≤25 minutes. Sauser *et al.* in their study reported the mean door to imaging time of 22.8 minutes with 68.4% patients had imaging within 25 minutes of hospital arrival which was well in concordance to our study [13].

Among 58 patients with ischaemic stroke who reached hospital within window period, only 60.3% cases were eligible candidates for thrombolysis with rtPA. Intravenous thrombolysis was administered in 1.7% in the study by Hoffmeister *et al*. in 2007 to 2009 in Chile [14]. Hsieh *et al*. reported IV rtPA for those ischemic patients admitted within 2 hours was 8.84% [8]. De Carvalho *et al.* in his study reported 18.67% were eligible for intravenous thrombolysis, and among them 69.5% were treated [5]. Schwamm et al in his study showed an increase in IV rtPA over a period of 5 years from 42.09% at baseline to 72.84% after the application of GWTG guidelines in US [10].Our study stand in between the pre and post GWTG era in US indicating area that may improve after adhering to set protocol like GWTG.

The recommended door to needle time in stroke is ≤ 60 minutes. In our study, out of 35 patients who underwent thrombolysis, 31.4% patients had door to needle time of ≤ 60 minutes. The mean door to needle time was 78.47±28.17 minutes with a range of 25-170 minutes. Reeves et al reported that door-to-needle time of ≤60 minutes was in only 14.40 % among 118 ischemic stroke patients treated with rtPA in 2001 - 2002 [15]. Our study comparable with Fonarow et al who reported that door-to-needle time of ≤60 minutes was in only 26.6% among 25 504 ischemic stroke patients treated with rtPA [16].

The most severe complication of rtPA therapy is intracranial haemorrhage as in our study 14.3% patients had symptomatic intracranial haemorrhage, 5.95% in study by Schwamm *et al.* [10] and 8.21% in study by Hsieh et al [8]. The higher rate of symptomatic intracerebral hemorrhage in our study may be because of thrombolysis in patients with age ≥80 years as well as thrombolysis done after 3 hours of symptom onset.

For antithrombotic therapy by the end of hospital day 2 the results are comparable to other studies as early antithrombotic therapy started in 94.14% patients in study by Hsieh *et al*. in 2006 to 2008 [8] and in 98.2% patients were started on early antithrombotic therapy in study by de Carvalho *et al.* in 2010 [5].

DVT prophylaxis was started in 59.6% patients in our study, Schwamm et al reported in 89.54% cases in 2007 [10] and in 100% patients in study by de Carvalho *et al*. [5].The lower utilization of DVT prophylaxis in our study as compared to other studies suggests lack of sensitization in medical staff and more sensitization of medical professionals needed for optimal utilization in our Institution.

Antithrombotic therapy was prescribed at discharge in 68.9% in the study by Hoffmeister *et al.* in 2007 to 2009 [14] and in 85.54% patients in study by Hsieh *et al*. from 2006 to 2008 [8]. 100% of patients were given discharge antithrombotics in study by de Carvalho *et al.* in 2010 [5]. Whereas our Institution's results are comparable to study done by Schwamm et al which improved to 98.88% in 2007 with 3.20% rise in this performance measure after starting quality improvement program GWTG - Stroke, which was 95.7% patients in 2003 [10]

Anticoagulant drugs were given to 70.96% patients at discharge and 29.03% were not given anticoagulants because these patients were from rural background and monitoring of therapy not possible and they opt out. Anticoagulation therapy was prescribed in 86.7% patients in study by de Carvalho *et al*. in 2010 [5] and In 2003 95.03% cases in study by Schwamm *et al*. which improved to 98.88% in 2007 with 3.36% rise in this performance measure after starting quality improvement program GWTG - Stroke [10]. The results can be better if INR monitoring facilities are there in rural parts of our state.

In our study statins were given to 96.9% patients at discharge out of 127 eligible patients.Hsieh et al in his study reported 38.69% patients discharged on lipid lowering drugs in 2006 - 2008[8]. 56.1% cases were discharged on lipid lowering drugs in the study by de Carvalho *et al*. in 2010 [5]. Our study is comparable to post GWTG era where Schwamm *et al*. reported 73.63% of cases in 2003 discharged on lipid lowering drugs in their study which improved to 88.29% in 2007 with absolute rise of 14.66% [10].

Out of 191 patients with ischaemic stroke 72 were eligible. Counseling for smoking cessation was done in 91.7% patients. 66.6% cases were counseled for smoking cessation in study by de Carvalho *et al.* in

2010 [5] in Brazil where as our results are comparable to post GWTG era as Schwamm *et al*. in his study showed an increase in counseling for smoking cessation over a period of 5 years from 65.21% at baseline to 93.61% after the application of GWTG guidelines in US from 2003-2007 [10].

CONCLUSION

Unawareness including unwillingness of attendants and local treatment was the major cause of delay in arrival followed by long distance from hospital. Public education regarding stroke is needed to decrease time from symptoms onset to ED presentation and potentially improve outcomes further. Hypertension and smoking were major preventable risk factors. Patients receiving IV rtPA within 3 hours of symptom onset, door to needle time of ≤ 60 minutes, DVT prophylaxis and anticoagulation therapy prescription are the areas requiring improvement and these may undergo improvement after adhering to set protocol like GWTG. This also represents area requiring improvement on the behalf of hospital and physicians.IV thrombolysis needs great caution in elderly population especially if done after 3 hours of symptom onset as it leads to more morbidity and mortality among these patients.

REFERENCES

1. Smith WS, English JD, Johnston SC. Cerebrovascular diseases. In: Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J, editors. Harrison's principles of internal medicine. 18th ed. United States. McGraw Hill; 2012:3270.
2. Strong K, Mathers C, Bonita R. Preventing stroke: saves lives around the world. Lancet Neurol 2007;6:182-7.
3. Badachi S, Mathew T, Prabhu A, Nadig R, Sarma G R K. Hurdles in stroke thrombolysis: Experience from 100 consecutive ischemic stroke patients. Ann Indian Acad Neurol 2015; 18: 415-18
4. Grimshaw JM, Russell IT. Effect of clinical guidelines on medical practice: a systematic review of rigorous evaluations. Lancet. 1993;342:1317–1322.
5. de Carvalho FA, Schwamm LH, Kuster GW, Alves MB, Neto MC, Silva GS. Get With The Guidelines Stroke Performance Indicators in a Brazilian Tertiary Hospital. Cerebrovasc Dis Extra 2012;2:26-35.
6. Smith EE, Saver JL, Alexander DN, Furie KL, Hopkins LN, Katzan IL, Mackey JS, Miller EL, Schwamm LH, Williams LS. Clinical Performance Measures for Adults Hospitalized With Acute Ischemic Stroke. Stroke. 2014 Nov 1;45(11):3472-98.
7. Banerjee TK, Mukherjee CS, Sarkhel A. Stroke in the urban population of Calcutta--and epidemiological study. Neuroepidemiol. 2001; 20:201-207.
8. Hsieh FI, Lien LM, Chen ST, Bai CH, Sun MC, Tseng HP, Chen YW, Chen CH, Jeng JS, Tsai SY, Lin HJ. Get with the guidelines-stroke performance indicators: surveillance of stroke care in the Taiwan Stroke Registry. Circulation. 2010 Sep 14;122(11):1116-23.
9. Sridharan SE, Unnikrishnan JP, Sukumaran S, Sylaja PN, Nayak SD, Sarma PS, Radhakrishnan K. Incidence, types, risk factors, and outcome of stroke in a developing country. Stroke. 2009 Apr 1;40(4):1212-8.
10. Schwamm LH, Fonarow GC, Reeves MJ, Pan W, Frankel MR, Smith EE, Ellrodt G, Cannon CP, Liang L, Peterson E, LaBresh KA. Get With the Guidelines–Stroke is associated with sustained improvement in care for patients hospitalized with acute stroke or transient ischemic attack. Circulation. 2009 Jan 6;119(1):107-15.
11. Poungvarin N. Stroke in the developing world. Stroke. 1998;352:19 –22.
12. Dalal PM, Malik S, Bhattacharjee M, Trivedi ND, Vairale J, Bhat P, Deshmukh S, Khandelwal K, Mathur VD. Population-based stroke survey in Mumbai, India: incidence and 28-day case fatality. Neuroepidemiology. 2008 Nov 1;31(4):254.
13. Sauser K, Levine DA, Nickles AV, Reeves MJ. Hospital variation in thrombolysis times among patients with acute ischemic stroke: the contributions of door-to-imaging time and imaging-to-needle time. JAMA neurology. 2014 Sep 1;71(9):1155-61.
14. Hoffmeister L, Lavados PM, Comas M, Vidal C, Cabello R, Castells X. Performance measures for in-hospital care of acute ischemic stroke in public hospitals in Chile. BMC Neurology 2013,13:23
15. Reeves MJ, Broderick JP, Frankel M, LaBresh KA, Schwamm L, Moomaw CJ, Weiss P, Katzan I, Paul Coverdell Prototype Registries Writing Group. The Paul Coverdell national acute stroke registry: Initial results from four prototypes. American journal of preventive medicine. 2006 Dec 31;31(6):S202-9.
16. Fonarow GC, Smith EE, Saver JL, Reeves MJ, Bhatt DL, Grau-Sepulveda MV, Olson DM, Hernandez AF, Peterson ED, Schwamm LH. Timeliness of tissue-type plasminogen activator therapy in acute ischemic stroke. Circulation. 2011 Feb 22;123(7):750-8.