

Frequency of Subtypes of Ischemic Stroke Using Bamford or Oxford Shire Community Stroke Project (OCSP) Classification in a Tertiary Care Hospital

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ABSTRACT

Introduction: Stroke is a most common and leading cause of disability in the world and affected patients are completely or partially dependent on others for their daily life activities. Ischemic stroke has various subtypes and classifications and we used Bamford or Oxford Shire Community Stroke Project classification system in our stroke patients to categorize them in subtypes of ischemic stroke. **Objective:** To observe and evaluate the frequency of various subtypes of ischemic stroke in patients admitted to our neurology setup according to their vascular territories. **Materials and Methods:** We conducted a cross sectional observational study on 160 ischemic stroke patients in the department of neurology, Shaikh Zayed Postgraduate Medical Complex from July 2014 to June 2015, and used a Bamford or Oxford Shire classification for subtypes of ischemic stroke in our acute stroke patients during their stay in hospital. Brain imaging such as computed tomography (CT) scan and magnetic resonance imaging (MRI) with or without diffusion-weighted sequences (DWI) of all patients were done and used as a major tool for classification of subtypes of ischemic stroke in our patients. Patients were evaluated and examined from the day of admission till their stay in hospital. **Sample size:** Total sample size estimated with 95% level of significance & margin of error 5 with 95% power test is 160 with 90 male and 70 female patients. Data was entered in computer software SPSS version 20.4. **Results:** Total 160 ischemic stroke patients with 90 male and 70 female patients participated in this study. Our study data shows Total Anterior Circulation Infarcts (TACI) in 23 (14.375%), Partial Anterior Circulation Infarcts (PACI) 89 (55.625%), Lacunar Infarcts (LACI) 32 (20.00%) and Posterior Circulation Infarcts (POCI) in 16 (10.00%) patients. According to sex distribution we have noted 10% male and 6.66% female patients with TACI, 26.25% male and 29.375% female with PACI, 10.625% male and 9.375% female with LACI. Total 4.375% male and 5.625% female patients were documented with POCI. **Conclusion:** The OCSP classification is an easy and simple classification system for subtypes of stroke to recognize the early stroke. The frequency of PACI and LACI are more common followed by TACI and POCI.

Key words: Bamford classification, Oxford Shire Community Stroke Project Classification (OCSP), TACI (Total Anterior Circulation Infarct), LACI (Lacunar Infarct), PACI (Partial Anterior Circulation Infarct) POCI (Posterior Circulation Infarct).

INTRODUCTION

Cerebrovascular event may be ischemic or hemorrhagic.¹ Ischemic stroke is most common and it results from impairment in the blood circulation of

brain which leads to imbalance or loss of brain functions.²

Ischemic stroke results from major arterial blockage that supplies blood to the brain and accounts for more than 80% of all strokes.^{3,4}

The Bamford, or Oxfordshire Community

Stroke Project (OCSP) classification is one of the stroke classification system practically used for subtypes of ischemic stroke.^{5,6} The early recognition of stroke is an important step for its proper diagnosis, work-up, management and prediction of its prognosis as well as its complications.⁷ There are different classification systems for stroke subtypes but Oxfordshire system is a common, fast and simple tool in early evaluation of stroke size and site on imaging without any special expertise.^{8,9} Bamford et al classified ischemic stroke patients of a community project study in 1991. Oxfordshire classification system consists of total anterior circulation infarcts (TACI), partial anterior circulation infarcts (PACI), lacunar infarcts (LACI), and posterior circulation infarcts (POCI).⁶ This OCSP classification system is based on distribution of blood circulation, infarcted areas, symptoms of patients and severity of stroke events. Neuroimaging studies have a major role in the evaluation of this classification system. Commonly used neuroimaging studies are computed tomography (CT) scan, magnetic resonance imaging (MRI) with or without diffusion-weighted sequences (DWI).⁸⁻¹²

MATERIALS AND METHODS

We conducted a cross sectional observational study on 160 ischemic stroke patients in the department of neurology, Shaikh Zayed Postgraduate Medical Complex from July 2014 to June 2015, and used a Bamford or Oxford Shire classification for subtypes of ischemic stroke in our acute stroke patients during their stay in hospital. Brain imaging such as computed tomography (CT) scan and magnetic resonance imaging (MRI) with or without diffusion-weighted sequences (DWI) of all patients were done and used as a major tool for classification of subtypes of ischemic stroke in our patients. Patients were evaluated and examined from the day of admission till their stay in hospital.

Sample size

Total sample size estimated with 95% level of significance & margin of error 5 with 95% power test is 160 with 90 male and 70 female patients. Data was entered in computer software SPSS version 20.4.

RESULTS

Total 160 ischemic stroke patients with 90 male and 70 female patients participated in this study. Our study data shows Total Anterior Circulation Infarcts (TACI) in 23 (14.375%), Partial Anterior Circulation Infarcts (PACI) 89 (55.625%), Lacunar Infarcts (LACI) 32 (20.00%) and Posterior Circulation Infarcts (POCI) in 16 (10.00%) patients. (Table 1). According to sex distribution we have noted 10% male and 6.66% female patients with TACI, 26.25% male and 29.375% female with PACI, 10.625% male and 9.375% female with LACI. Total 4.375% male and 5.625% female patients were documented with POCI. (Table 2).

Table 1: Distribution of subtypes of ischemic stroke (n =160)

Subtypes of stroke	No. of patients	%age
TACI	23	14.375
PACI	89	55.625
LACI	32	20.00
POCI	16	10.00

Table 2: Subtypes of stroke according to Distribution of sex (n=160).

Sex	TACI	PACI	LACI	POCI
Male	13 (8.125%)	42 (26.25%)	17 (10.625%)	7 (4.375%)
Female	10 (6.25%)	47 (29.375%)	15 (9.375%)	9 (5.625%)

DISCUSSION

Bamford et al.⁶ had documented in 543 ischemic stroke patients as 17% with TACI; 34% PACI; 24% patients had found with POCI while LACI were found in 25% patients. To compare their study with our recent study data the frequency of patients with TACI is 14.375% vs 17%, PACI is 55.625% vs 34%, LACI 20% vs 25% and POCI frequency is 10% vs 24%. It shows that frequency of TACI has no much difference between both studies but the number of patients with PACI and POCI has significant difference. In our study the frequency of

PACI is higher than Bamford et al.⁶ while their data shows very high frequency of POCI which is not comparable with this study. Although frequency of LACI is comparable in both studies.

Yuling et al¹³ has documented in his 1,115 patients the frequency of TACI 17.67%, PACI were 62.78%, LACI were 5.83% and POCI were 13.72%. Their study shows that frequency of PACI is higher than all other three subtypes which are comparable with our study but this study has more patients with PACI than our findings. In both studies TACI and POCI are comparable with each other without any significant difference. There is a significant difference in frequency of LACI. Yuling et al¹³ shows very small percentage of LACI compared with our study findings. A study by Else Charlotte et al¹⁴ has documented 7.478% patients with TACI, 49.275% with PACI, 29.565% and 13.681% patients with LACI and POCI respectively. This study is also closely comparable with our study data findings except the frequency of TACI. A study of 225 patients with ischemic stroke aged 18-45 years by Li et al¹⁵ observed TACI 6.7%, PACI 52.0%, LACI 27.1% and POCI 14.2%. This study is comparable with our study in PACI and POCI with some significant difference in LACI. The number of TACI is very high in our study compared to Li et al.¹⁵

A multi-centre study¹⁶ of seven different countries shows TACI 26.7%, PACI 29.9%, POCI 16.7% and LACI 26.7% which demonstrate a significant lower number of PACI than our study. N Campanella et al¹⁷ has documented TACI 19.8%, PACI 29.6%, LACI 30.9% and POCI 8.6%. According to this study there were 11.1% patients who had infarcts in multiple areas of the brain.

In a study by Sheng-Feng Sung et al¹⁸ the percentage of TACI is much higher and frequency of PACI is lower compared with our study. According to Sheng et al¹⁸ the frequency of TACI was 53.793%, PACI 20%, POCI 11.034 and of LACI was 15.172.

A local study conducted on 147 ischemic stroke patients has observed frequency of TACI with 24.49%, PACI with 29.25%, LACI and POCI 25.85% and 20.41% respectively.¹⁹ This study is also comparable with our study in three subtypes of ischemic stroke but the frequency of PACI is higher

in our study than their study findings. Multiple studies show higher frequency of PACI than all other subtypes of ischemic stroke and there is a significant number of lacunar infarcts in various studies despite it that OCSF classification system does not differentiate the cortical and subcortical small vessels infarcts.

CONCLUSION

The OCSF classification is an easy and simple classification system for subtypes of stroke to recognize the early stroke. The frequency of PACI and LACI are more common followed by TACI and POCI.

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