3-2015

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This original article is available in Pakistan Journal of Neurological Sciences (PJNS): http://ecommons.aku.edu/pjns/vol10/iss1/5
POST STROKE DEMENTIA AND ITS PUTATIVE RISK FACTORS: A HOSPITAL-BASED STUDY

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Date of Submission: July 17, 2014, Date of Revision: October 29, 2014, Date of Acceptance: November 5, 2015

ABSTRACT

Introduction: Dementia is common after stroke and has a considerable impact on mortality, rehabilitation and quality of life. There are some published articles regarding post stroke dementia but there are many controversies surrounding this topic. Our aim was to identify the prevalence of post stroke dementia 3 months after stroke and evaluation of some its putative risk factors in Iranian population. Method: In this cross-sectional study, 151 patients with acute stroke were evaluated. The diagnosis was confirmed by physical examination and neuroimaging. Three months after the stroke, all patients were visited again. The diagnosis of post stroke dementia was made according to the criteria in the DSM-IV. Demographic data were collected using a questionnaire and data about lesion location and kind of stroke were obtained according to neuroimaging. To analyze the data, descriptive statistics, and chi-square test were used. Results: In our study, 47% patients were male and the rest were female. Thirty five (23.2%) of patients had post stroke dementia(PSD) after 3 months. 70.6 % of patients were 60 years old or more. 88.7% of patients had ischemic infarction and the rest had hemorrhagic stroke. The most frequent lesion locations were temporal, frontal and parietal lobes respectively. There was no significant statistical difference between PSD and sex, age, educational status, lesion location and kind of stroke. Conclusion: Our results show that a significant portion of patients with stroke are prone to PSD. The risk of dementia occurring after a stroke does not seem to be influenced by the stroke type.

Key words: Dementia, Stroke, Risk factor

INTRODUCTION

Stroke is one of the most leading causes of mortality and disability in the world. (1) Many patients are left with residual cognitive deficits such as personality disorders, depression and memory loss after acute phase of stroke (2, 3). Post stroke dementia (PSD) is the second most common cause of dementia (4) and one of the main causes of dependency in survivors and includes any dementia after a stroke, irrespective of its cause (5). In Europe and North America, Alzheimer's disease predominates over PSD in a 2:1 ratio; in contrast, in some Asian countries PSD accounts for almost 50% of all dementias (6). Its prevalence ranges from 6 to 32% (7) and it has been found to be higher than previously expected, and a stroke increases the risk of dementia 4 to 12 times (8). The diagnosis of PSD is based on the patient history, the clinical evaluation and neuroimaging (9), and it is associated with high rates morbidity and mortality (2). Then, it is important to determine its risk factors. Some demographic, genetic and lesion-related radiological factors have been reported to predict dementia in stroke patients, but there has not been a consensus about them (10, 11). Realizing the importance of research in this field and lack of any published studies about PSD from Iran, we decided to evaluate the prevalence of PSD and some of its putative risk factors. To our knowledge, this is the first hospital-based study among Iranian population about PSD.

METHODS

1. Subjects

This cross-sectional study was conducted on 151 patients with first-ever stroke in Rafsanjan (south of Iran). Patients with a clinical suspicion of stroke underwent neuroimaging (CT scan and MRI) and the diagnosis was confirmed by them. All patients with history of any underlying disease especially dementia and mild cognitive
impairment were excluded from the study except patients with ischemic heart disease (IHD), diabetes (DM), hypertension (HTN) and hyperlipidemia (HLP). Other exclusion criteria were history of opium or other substance addiction, inadequate vision and hearing, aphasia, any drug consumption (except drugs were used for treatment of IHD, DM, HTN, HLP) such as antipsychotic and anti depressant. The ethics committee of Yazd branch of Islamic Azad University had confirmed the research.

2. Clinical characteristics

Following information was collected for each patient: baseline demographics (age, gender and educational status), stroke type according to Oxfordshire Community Stroke Project Classification. The subjects were screened for PSD using the DSM-IV at three months.

3. Statistical analysis

To analyze the data, descriptive statistics, and chi-square test were used and p<0.05 was considered statistically significant.

RESULTS

In our study, 71(47%) patients were male and the rest were 80 (53%) female. Mean age of men and women were 65.5 and 66.5 years, respectively. 35 (23.2%) patients had PSD after three months. 70.6 % of patients were 60 years old or more. 88.7% of patients had ischemic infarction and the others had hemorrhagic stroke. The most frequent lesion locations were temporal, frontal and parietal lobes respectively. There was no significant statistical difference between PSD and sex, age, educational status, lesion location and kind of stroke. (Table 1)

CONCLUSION

In our hospital-based study prevalence of PSD was 23.2 %. This finding shows that a significant portion of patients with stroke are prone to PSD. We did not find any published article about PSD concerning the Iranian population; it seems that in Iranian population, our study is the first in this field but many studies have been conducted in other countries. Prevalence of PSD is reported to be between 7% and 41%, (10). Some studies show the same frequency of PSD as our study, such as those conducted in Italy (24.6%) and America (26.3%) (12,13) where as others show lower prevalence such as Portugal( 5.9% ) and Taiwan( 9.2%) (14, 15) or higher in Finland (31.8%) (16). In a systematic review ,the prevalence of post stroke memory dysfunction varied from 23% to 55% 3 months post stroke, which declined from 11% to 31% 1 year post stroke. (17). The prevalence of dementia among people with a history of stroke is similar to that observed in subjects 10 years older without a history of stroke (18). Also, several studies have confirmed that stroke doubles the probability of developing dementia and that risk is higher in the first 6-12 months and in a community based study done over 25 years, the cumulative incidence of PSD was 7% after 1 year, 10% after 3 years, 15% after 5 years, 23% after 10 years, and 48% after 25 years (19). These discrepancies may be related to different population studies, different criteria used for the diagnosis of dementia and different time interval between stroke and the neuropsychological assessment (20). Although, stroke was recognized as an important cause of dementia more than a century ago (21), many aspects of PSD pathophysiology are not clear. The causes of PSD are multifactorial and involve neuronal networks needed for memory (22). Disturbance in some neurotransmitters (6), genetic factors (23), direct neuronal damage and impaired vascular autoregulatory mechanisms are some factors involved in PSD pathophysiology. (2, 24, 25) Our results showed that PSD can be seen in both ischemic and hemorrhagic lesions. The risk and severity of cognitive disturbances occurring after a stroke do not seem to be influenced by type of stroke (ischemic or hemorrhagic) (8, 13, 14). In most studies such as ours, no gender specificity was observed (15,21). Similarly, many studies did not find any relationship between location of the vascular lesion and PSD (14,15,21). Higher educational attainment has been found to be a protective factor for PSD (5) however, we could not ascertain this effect in our study and neither could the research performed in Spain (21). Although we did not find a relationship between age and dementia, some have studies suggested an association between the two (11, 24). It should be mentioned that controversies about age, sex, location of lesion and educational

Table1: Frequency of risk factors in patients
status are frequent\(^7\), and some factors such as dysphasia, hemiparesis, hemianopia\(^10\), silent infarcts, cortical cerebral atrophy\(^26\) medial temporal lobe atrophy and white matter changes have been associated with an increased risk to develop PSD in some studies\(^19\). Our study had some limitations. First, our study was a cross-sectional study. Second; we followed the patients only three months. Third, patients with aphasia were excluded from our study. These limitations may have some effects on the results. In conclusion, our study showed high prevalence of PSD in Iranian population. Both ischemic and hemorrhagic lesions have a similar effect on PSD and early recognition and treatment of PSD risk factors will definitely improve the quality of life of the patients.

**Acknowledgment:** Authors thank the Yazd branch of Islamic Azad University for supporting this project.

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INTRODUCTION

Post stroke cognitive impairment (PSCI) is defined as cognitive impairment occurring 3 months after a stroke. It can present as immediate or delayed PSCI. Some studies report that cognitive impairment occurs in up to 40% of people who have had a stroke. The prevalence of all types of cognitive impairment occurring at least 3 months after stroke, or post stroke dementia (PSD) ranges between 4% and 27% (1). PSD represents approximately 15% of stroke cases, it predominates over PSD in a 2:1 ratio; in contrast, in Europe and North America, Alzheimer’s disease and dementia are frequently reported to be between 7% and 41%, (10). Some studies have shown that the risk of PSD is 2 to 10 times higher than the risk of dementia in the general population (3, 11). The risk of PSD 10 years after a stroke (12-14) is reported to be between 7% and 41%, (10). Some studies have shown that the risk of PSD is 2-10 times higher than the risk of dementia in the general population (3, 11). This study aimed to determine the prevalence of PSD and some of its putative risk factors in patients with stroke in Rafsanjan, south of Iran. Patients with a clinical suspicion of stroke under-}

incidence of cognitive impairment (PSD) after stroke is similar to that of the underlying disease especially dementia and mild cognitive impairment were excluded from the study except those with a history of stroke. The patients were screened for PSD using the DSM-IV at three months. The data were collected from the patients and the control group were selected based on the same method: 2:1, gender and age according to the control group. The control group was compared with the first group. The patients were compared according to their NINDS-AIREN stroke Project Classification. The subjects were divided into two groups: patients with first-ever stroke and patients with recurrent stroke. The results of this study showed that the prevalence of PSD 1 year post stroke was 31%. The prevalence of dementia varied from 23% to 32% (17). The prevalence of dementia in stroke patients is higher than that in the general population. Some of the studies show the prevalence of PSD to be 10-12 times (8). The diagnosis of PSD is based on the presence of cognitive impairment in the patient, the presence of a prior stroke, and the absence of other causes of cognitive impairment. The DSM-IV criteria for the diagnosis of PSD include the following: cognitive impairment (memory, language, attention, executive function, or visuospatial skills) that is new in onset and not due to a general medical condition; a prior history of stroke or transient ischemic attack; and the absence of adequate alternative explanations for the cognitive impairment. The DSM-IV criteria for the diagnosis of PSD can be divided into three categories: a primary diagnosis of PSD, a secondary diagnosis of PSD, and a mixed diagnosis of PSD. A primary diagnosis of PSD is defined as the presence of cognitive impairment in a patient who has a prior history of stroke or transient ischemic attack, and the absence of adequate alternative explanations for the cognitive impairment. A secondary diagnosis of PSD is defined as the presence of cognitive impairment in a patient who has a prior history of stroke or transient ischemic attack, and the presence of adequate alternative explanations for the cognitive impairment. A mixed diagnosis of PSD is defined as the presence of cognitive impairment in a patient who has a prior history of stroke or transient ischemic attack, and the presence of both adequate and inadequate alternative explanations for the cognitive impairment. The prevalence of PSD among patients with stroke has been reported to be 7-41%. Some studies have reported the prevalence of PSD to be 5-21% (15). It should be mentioned that controversies exist among the researchers regarding the definition and diagnosis of PSD.}

The study aimed to determine the prevalence of PSD and some of its putative risk factors in patients with stroke in Rafsanjan, south of Iran. Patients with a clinical suspicion of stroke under-


data collection, data analysis, manuscript review

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Conflict of Interest: Author declares no conflict of interest.

Funding Disclosure: Nil

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