POST STROKE DEMENTIA AND ITS PUTATIVE RISK FACTORS: A HOSPITAL-BASED STUDY

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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 filed 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 underling 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 $p \leq 0.05$ was considered statistically significant.

RESULTS

In our study, 71(47%) patients were male and the rest were80 (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)

PSD Variable		Yes	No	P value
		N(%)	N(%)	
Sex	M	18(25.35)	53(74.64)	0.355
	F	17(21.25)	63(78.75)	
Age	59 or less	10(22.73)	34(77.27)	0.511
	60 or more	14(13.9)	93(86.91)	
Lesion location	Temporal	13(30.23)	30(69.76)	0.292
	Frontal	8(26.66)	22(73.33)	
	Parietal	4(16)	21(84)	
	Occipital	3(27.27)	8(72.73)	
	Infratentorial	1(5)	19(95)	
	More than one location	6(27.27)	16(72.72)	
Educational status	Illiterate	7(25)	21(75)	0.957
	Elementary	10(23.25)	33(76.74)	
	Diploma	7(20)	28(80)	
	Associates degree	5(22.72)	17(77.27)	
	Bachelor	5(23.80)	16(76.19)	
	Master or higher	1(50)	1(50)	
Kind of stroke	Ischemic	29(21.64)	105(78.58)	0.209
	Hemorrhagic	6(35.29)	11(64.70)	

Table1: Frequency of risk factors in patients

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 patophysiology. [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 specifity 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, 21]. It should be mentioned that controversies about age, sex, location of lesion and educational

status are frequent[7 ,11], 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 fallowed 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.

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