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Prevalence of post stroke dementia in Iranian patients: A systematic review and meta-analysis

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Abstract

Introduction: Stroke is the third common cause of mortality worldwide and the most common neurological disability disorder among adults. The aim of this study was to evaluate Prevalence of post stroke dementia in Iranian patients.

Methods: The methods used in this systematic review were developed in accordance with the PRISMA checklist instructions . Cross-sectional, case control, and cohort studies were included in this research, and the case series, letter to editors, case reports, clinical trials, study protocols, systematic reviews, and narrative reviews were excluded.

Results: According to the results from the random effects model, the total Prevalence of post stroke dementia in Iranian patients among the 548 Iranian patients with stroke disease cases was 8.9% (95% confidence interval [CI]: 6.6, 11.2, I²=96.5).

Discussion: Given the prevalence of post-stroke dementia, it is essential to inform the public about dementia symptoms and caring methods for dementia patients. The elderly people are required to be periodically evaluated by special centers, so that asymptomatic or underlying diseases creating dementia are diagnosed in time, and the individuals undergo the required treatments. Moreover, the medical staff are required to receive sufficient and updated information on the course of the disease as well as the best preventive, diagnostic, and therapeutic methods.

Keywords: stroke survivors, Stroke, Related factors, Dementia

Introduction

Stroke is the third common cause of mortality worldwide and the most common neurological disability disorder among adults (1). The prevalence of stroke increases with age (2). Men are more likely to suffer from stroke than women (3). Moreover, stroke is more common among African-Americans than white men and women (4). The risk factors of stroke include hypertension, high blood cholesterol levels, smoking, alcohol abuse, and using contraceptive pills (5). Stroke is regarded as the most serious neurological disorder (6). Stroke accounts for half of emergency hospitalization cases in neurological diseases (7). Although the prevalence of stroke has reduced in the past few decades (mainly due to the improvements

made in the treatment of hypertension), it is still ranked first among neurological diseases of adults in terms of significance and prevalence rate (8). Dementia is defined as the regression and destruction of cognitive abilities, especially memory, without any disorder in the consciousness level; the individual's everyday performance is thus disordered (9). The most common type of dementia is called Alzheimer's disease accounting for 50-60% of dementia patients. Another common type of dementia is vascular dementia; vascular dementias is the second most commonly diagnosed type of dementia after Alzheimer's disease (10). Post-stroke dementia refers to the occurrence of dementia after a stroke. Cognitive disabilities are common after strokes, and they impose heavy caring costs on families (11). When there is a

cognition disorder, the performance and behavior of dementia patients will be increasingly dependent on others for normal activities of daily life. The complicated needs of these individuals are likely to cause stress and discomfort for caregivers of these patients in managing their needs (12). Vascular dementia has various prevalence rates ranging from 1.5% in 75-to-79-year-old women in America to 16.3% in over 80-year-old men in Italy and even 50% of the entire clinical cases of dementia in Japan (13).

Methods

Inclusion Criteria (Eligibility Criteria)

The methods used in this systematic review were developed in accordance with the PRISMA checklist instructions. Cross-sectional, case control, and cohort studies were included in this research, and the case series, letter to editors, case reports, clinical trials, study protocols, systematic reviews, and narrative reviews were excluded. Output: The main goal was to find the prevalence, and the output was collected as it was reported. Sampling techniques and sample size: all observational studies were excluded in the systematic review regardless of their design. The minimum sample size was greater than or equal to 25 (patients).

Search Strategy

The searches were conducted by two independent researchers in the international (PubMed, Web of Science, Scopus, and Google Scholar) and national databases (Magiran and SID) to find the relevant studies published in English and Persian languages since the creation of the databases until September 2017 (without time limitations). To ensure the literature saturation, the list of the included research references or the relevant reviews found by searching was studied. The special search strategies were created using the Health Sciences Librarian website with specialization in systematic review searches using the MESH phrases and open phrases in accordance with the PRESS standards. After finalizing the MEDLINE strategy, the results were compared to search the other databases. Similarly, PROSPERO was searched to find the recent or ongoing systematic reviews. The keywords used in the search strategy were “stroke survivors, Stroke, Related factors, Dementia”, and “Iran”, which were combined using the AND, OR, and NOT operators.

Study Selection and Data Extraction

Two researchers independently analyzed the titles and abstracts of the articles with regard to the research eligibility criteria. After omitting the redundant studies, the full texts of the studies were assessed against the eligibility criteria and the information on the authors was collected when required. General information (the corresponding author, province, and year of publication), the study information (the sampling technique, questionnaire design, information collection method, research conditions, sample size, and risk of bias), and the output scales (prevalence) were collected.

Quality Assessment

The scale developed by Hoy et al. was used to assess the quality of the methodology and the risk of bias for each observational study. This 10-item scale is used to assess the quality of the studies with respect to their external validity (items 1 to 4 assess the target population, sampling framework, and minimum participation bias) and internal validity (items 5 to 9 assess the data collection method, problem statement, research scale, and data collection instruments while item 10 assesses the bias of data analysis). The risk of bias was measured independently by two researchers, and the differences were solved by reaching a consensus.

Data Aggregation

All of the eligible studies were included in the data aggregation following a systematic review and the data was integrated using a forest plot. The random effects model was assessed based on the overall prevalence of the participants. The heterogeneity of the preliminary studies was tested using the I^2 test. Besides, the subgroups were analyzed to determine the heterogeneity based on the gender and age of the respondents. Finally, a meta-analysis was conducted in STATA 14 statistical software.

Results

Study Selection

A total of 285 articles were extracted through our preliminary searches in different databases. Of the 91 non-redundant studies identified by analyzing the titles and abstracts, 62 studies were ruled out due to irrelevant titles. Of the existing 29 studies, 2 studies

met the inclusion criteria, and of the 27 excluded studies, 7 were review articles, 6 were letters to editor,

and 14 did not meet the minimum inclusion criteria (Fig. 1).

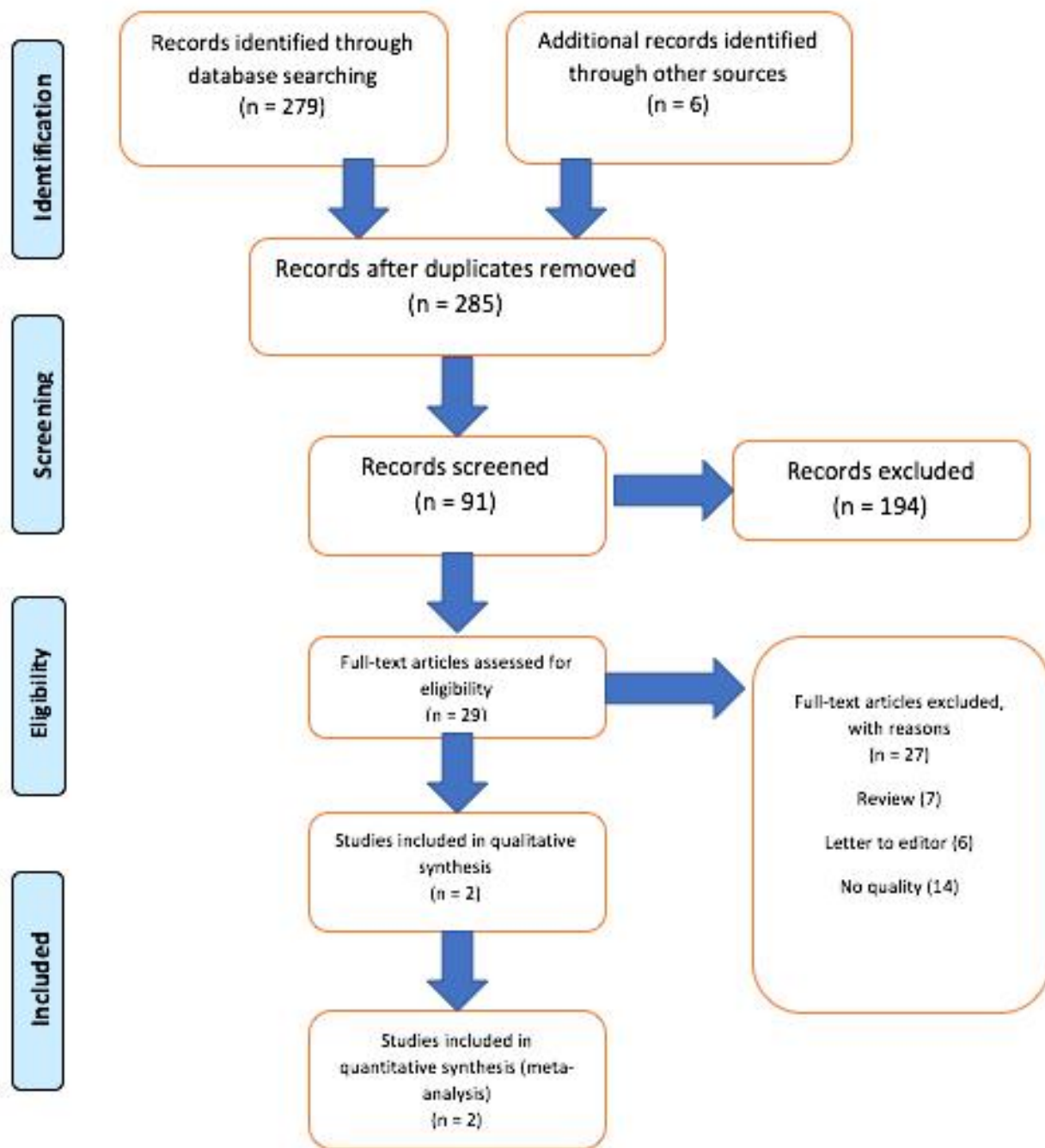


Fig 1.

Research Specifications

A total of 568 patients suffering from stroke disease were studied. The age of the participants varied between 30 and 80 years. Both studies presented cross-sectional data. A total of 2 studies from 2 provinces meeting the inclusion criteria were

reviewed. studies were from Isfahan and Birjand. The sampling technique in both studies was simple sampling (n=2). All of the studies had low risk of bias. All prevalent data collection methods were the interview and self-report methods used in 2 studies. Both study locations were also hospitals (Table 1).

Table 1. Studies included in the systematic review

Author	Year	Sample size	Province	Prevalence	Risk of bias
Ghandhari ⁽²⁰⁾	2007	362	Birjand	0.06/1	Low
Rezaei ⁽²¹⁾	2015	206	Isfahan	0.23/3	Low

Meta-Analysis of Prevalence of post stroke dementia in Iranian patients:

According to the results from the random effects model, the total Prevalence of post stroke dementia in

Iranian patients among the 548 Iranian patients with stroke disease cases was 8.9% (95% confidence interval [CI]: 6.6, 11.2, I²=96.5).

Table 2:Prevalence of post stroke dementia in Iranian patients

ID	First Author	Year	Province	ES	95%CI for ES		% weight
					Low	Up	
1	Ghandhari	2007	Birjand	0.061	0.036	0.086	83.86
2	Rezaei	2015	Isfahan	0.233	0.175	0.291	16.14
Sub-total Random pooled ES	-----	-----	-----	0.089	0.066	0.112	100

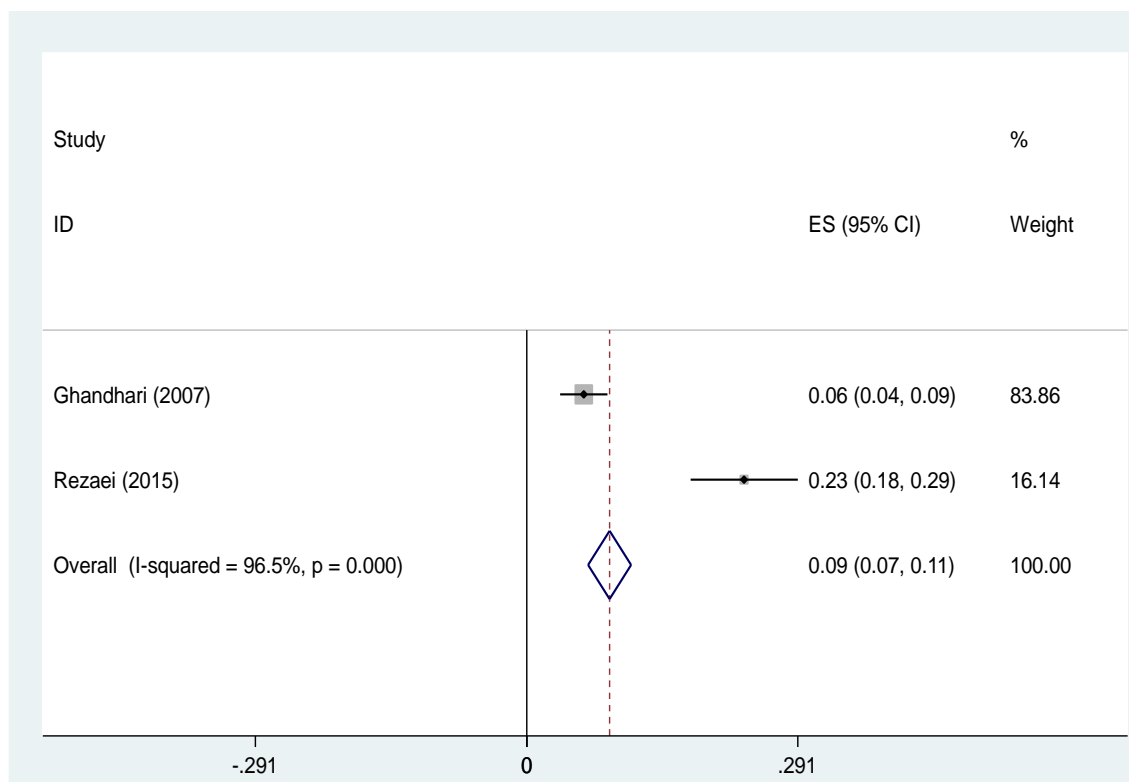


Fig. 2 :Prevalence of post stroke dementia in Iranian patients disease and its 95% interval for the studied cases according to the year and the city where the study was conducted based on the model of the random effects model. The midpoint of each section of the line estimates the% value and the length of the lines showing the 95% confidence interval in each study. The oval sign shows Prevalence of post stroke dementia in Iranian patients

Discussion

According to the results from the random effects model, the total Prevalence of post stroke dementia in Iranian patients among the 548 Iranian patients with stroke disease cases was 8.9% (95% confidence interval [CI]: 6.6, 11.2, $I^2=96.5$). Stroke has some unpredicted and destructive effects on patients; these effects result in numerous changes in their lives and affect their quality of life as well (14). Various mental disorders occur after strokes; these disorders and their treatments vary in different patients (15). Furthermore, the serious threats of strokes for the society and the high rates of mental complications of stroke imply that similar studies are likely to reveal the manifestation pattern of the aforementioned cases in our country and the possible differences with the existing texts (16). They can also be greatly helpful in providing special strategies (17). Identifying these disorders, introducing the mental complications of strokes to the physicians, and discussing their different treatment methods are of high significance in the general health status of the community; they can reduce the mental pressures of the individuals and family members especially those care for them (18). The studies conducted in this regard indicate that vascular dementia is more common among patients with stroke caused by atherosclerosis, and its risk factors are more common. Given the prevalence of post-stroke dementia, it is essential to inform the public about dementia symptoms and caring methods for dementia patients. The elderly people are required to be periodically evaluated by special centers, so that asymptomatic or underlying diseases creating dementia are diagnosed in time, and the individuals undergo the required treatments. Moreover, the medical staff are required to receive sufficient and updated information on the course of the disease as well as the best preventive, diagnostic, and therapeutic methods (19).

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