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Original scientific paper

DEMOGRAPHIC ANALYSIS OF PATIENTS WITH PARKINSON'S AND ALZHEIMER'S DISEASE

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Abstract

Parkinson's disease is the second most common progressive neurodegenerative disorder affecting adults and older adults and is predicted to increase over time as the population ages. As a result of a pathophysiological loss or degeneration of dopaminergic neurons of substantia nigra in the midbrain. Alzheimer's disease (AD) was first described by dr. Alois Alzheimer as a secretive and slow progressive neurodegenerative disorder of the human central nervous system (CNS). Our aim is that we are looking at all demographic data of patients with a diagnosis of Parkinson's and Alzheimer's disease. The study included 945 patients who were hospitalized in the Neurology Department of Skopje Clinical Hospital for the period from January 2014 to January 2024, of whom 772 patients met all the conditions for the study. The statistical program for social sciences (SPSS) version 25.0 with license was used for data analysis. Based on the diagnosis and gender test, the results show a significantly significant presence of men diagnosed with Parkinson's with 420 patients, while in women a significantly lower presence with 288 patients. In conclusion, this work can contribute to helping health professionals design more effective strategies that can help to care and support patients who are affected by neurodegenerative diseases.

Keywords: age group, gender, average age, diagnosis.

Introduction

Parkinson's disease is the second most common progressive neurodegenerative disorder affecting adults and older adults and is predicted to increase over time as the population ages. As a result of a pathophysiological loss or degeneration of dopaminergic neurons of substantia nigra in the midbrain. Idiopathic Parkinson's disease is linked to risk factors including ageing, family history, pesticide exposure and environmental chemicals. Characterized by both motor and non-motor symptoms, PD patients exhibit classically tremor, stiffness, bradykinesia and bent posture. PD may also be associated with behavioral disorders (depression, anxiety), cognitive impairment (dementia), and autonomic dysfunction. (orthostasis and hyperhidrosis). (Beitz, J. M 2014).

Alzheimer's disease (AD) was first described by doctor Alois Alzheimer as a secretive and slow progressive neurodegenerative disorder of the human central nervous system (CNS) (Alzheimer et al. 1995). Clinically, his earliest sign is a subtle decline in memory functions in a state of clear consciousness. Intellectual and practical skills gradually deteriorate, and personality changes emerge, followed by deterioration of language functions, impairment of visual tasks, and, ultimately, irregular autonomy and motor system malfunction in the form of hypochenetic hypertonic syndrome. (Morris et al. 2014). Both the rate of cognitive decline and the duration of the disease as well as neurological symptoms can vary significantly from individual to individual (Franssen et al. 1993).

Aim of the study

The aim of the study is that we are looking at all demographic data of patients with a diagnosis of Parkinson's and Alzheimer's disease. Furthermore, to determine the number of patients by age group, gender differences in the distribution of diagnoses, and the difference in age of patients according to diagnosis.

MATERIAL AND METHODS

The study included 945 patients who were hospitalized in the Neurology Department of Skopje Clinical Hospital for the period from January 2014 to January 2024, of whom 772 patients met all the conditions for the study.
The statistical program for social sciences (SPSS) version 25.0 with license was used for data analysis. The results in this study are expressed in numbers and percentages. We have presented our results through tables and graphs.

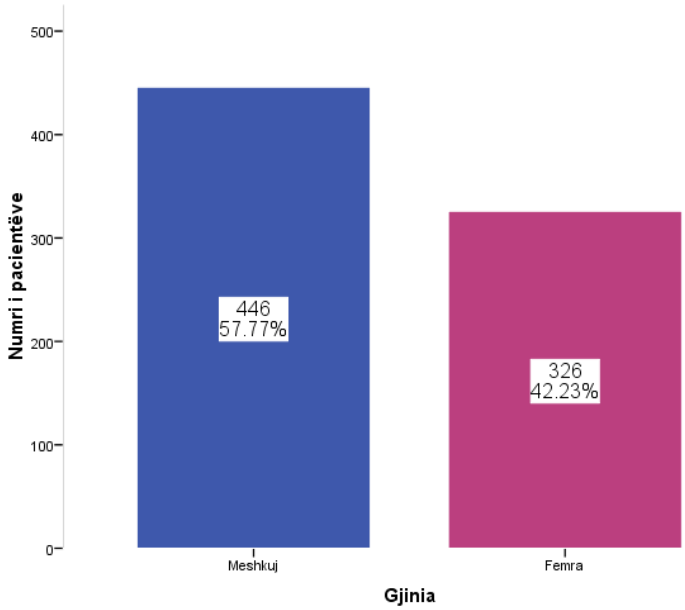
Results

Demographics by gender and age of patients

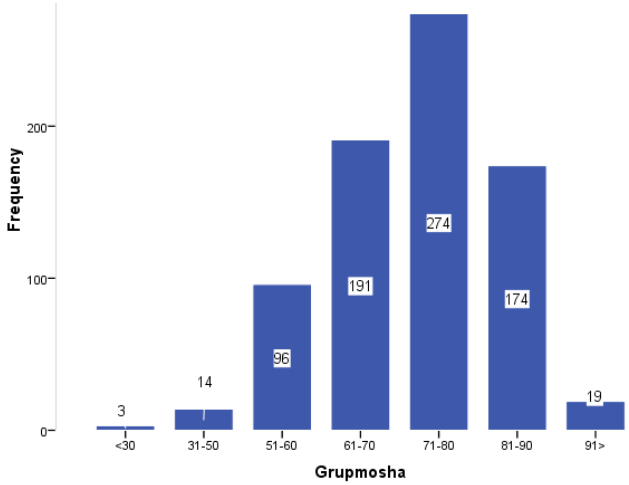
The study analyzed data from 772 patients who were hospitalized, of which 446 men or 58% and 326 female patients with 42%, with an average age of 72, of whom the minimum age is 21 and the maximum 101 years, with a standard deviation of 10 years. Age groups are predominately aged 71 to 80 with 274 patients, i.e. 36%.
In table 1 the number of patients by age group shows that 3 patients are aged between 30 years, while 31 to 50 we have 14 patients, 51 to 60 years old 96 patients, 61 to 70 years old we have 191 patients, then 81 to 90 years old we have 174 patients and over 91 years of age we have only 19 patients. The most present age group is patients aged 61 to 90.

Table 1. Data on the number of patients by gender and age group

		Number of subjects	%
Gender	Male	446	58%
	Female	326	42%
	Total	772	100%
Age group	<30	3	0%
	31-50	14	2%
	51-60	96	12%
	61-70	191	25%
	71-80	274	36%
	81-90	174	23%
	91>	19	2%



Graphic 1. Graphic presentation by gender



Graphic 2. Graphic presentation by age group

The first objective of the study was compared the age of patients according to their diagnosis, whereas of the 770 patients involved in the first diagnosis with the highest age are Alzheimer's patients with an average age of 80, while secondly those who have both Parkinson's and Alzheimer's diagnoses with an average age of 78, and then there are the Parkinson's with an average age of 72. According to comparative analysis, there are significant differences in age and diagnosis of patients, with relatively lower ages appearing with Parkinson's from 26 to 101 years of age, while older ages appear more with Alzheimer's.

Table 2. Average age of patients by diagnosis

	N	Average	Standard deviation	Minimum	Maximum
Parkinson	707	72.08	10.883	26	101
Alzheimer	25	80.04	8.121	63	91
Parkinson-Alzheimer	38	78.74	7.062	63	91
Total	770	72.67	10.821	26	101

F=13.210
p=.00
df=2

Table 3. Number of patients by diagnosis and age group

		Diagnose			
		Parkinson	Alzheimer	Parkinson-Alzheimer	Total
Age group	<30	2	1	0	3
	31-50	14	0	0	14
	51-60	96	0	0	96
	61-70	185	3	3	191
	71-80	245	9	20	274
	81-90	149	11	14	174
	91>	16	2	1	19
Total		707	26	38	771

$\chi^2 = 39.967, p=0.00$

Based on the diagnosis and gender test, the results show a significantly significant presence of men diagnosed with Parkinson's with 420 patients, while in women a significantly lower presence with 288 patients. Alzheimer's diagnosis is more common among women with 17 patients, while fewer in men with 9 patients. Even in patients with two diagnoses, there is a slightly pronounced presence in women with 21 patients, compared to men with 17 patients.

Table 4. Comparison of patients based on diagnosis and gender

		Diagnose			
		Parkinson	Alzheimer	Parkinson-Alzheimer	Total
Gender	Male	420	9	17	446
	Female	288	17	21	326
Total		708	26	38	772

$\chi^2 = 9.06, p=0.01$

Discussion

Estimates of the incidence of Parkinson's disease can be influenced by numerous factors, including population age, geographic location, genetic and environmental risk prevalence and protective markers, as well as case insurance and diagnosis methods. (Willis, A et al., 2022)
The study we analyzed was conducted in European countries, where we see that the average age of the population studied was 65.0 years (ranging from 62.2 years in Germany to 68.8 years in France) and 50.5% were male. Most of the participants (85.9%) were aged between 50 and 79. (Tolosa, E et al., 2021)
Another study of administrative claims, by the French national health insurance system (Système National d'Information Inter-Régimes de l'Assurance Maladie) found comparable rates of incidence in patients with Parkinson's disease, ranging from 74 to 140 (age 65-74), 210-277 (age 75-84) and 299 (age 85-89). (Willis, A et al., 2022). The results that are similar to the patient age group results in our study, where we have: age group 61-70 have 185 patients, 71-80 group have 245 and age group 81-90 have 149 patients.
Our results show an increase in the number of age-related patients with Alzheimer's disease. By analyzing other work we encountered similar results with our own incentive, where we see that the percentage of people with Alzheimer's increases dramatically with age: 3% of people aged 65-74, 17% of people aged 75-84 and 32% of people aged 85 or older have Alzheimer's dementia. (Alzheimer's Association 2020)
This study showed that there was a higher prevalence of Alzheimer's disease in the female gender compared to male, which is consistent with other studies reporting a higher risk of AD in women (Niu H et al., 2017) which also corresponds to our results, where the female gender is more affected than the male gender.
Incidence estimates were higher in males compared to females of all age groups, (Willis, A et al., 2022), males had a higher incidence of PD across all age groups, this difference was statistically significant for those aged 60-69 and 70-79 ($p < 0.05$). (Hirsch, L et al., 2016) Compared to our results, which showed a significantly significant presence of men diagnosed with Parkinson's with 420 patients, and in women a significantly lower presence with 288 patients.
There are differences by gender and diagnosis, where men have significantly greater presence of Parkinson's diagnosis where the p value was 0.01 ($p = 0.01$). We see a similarity to previous studies.

Conclusion

In this study we analyzed the demographic distribution of patients who were affected by Parkinson's and Alzheimer's disease, where we focused on the number of patients by age group, gender differences and differences in average age and diagnoses. The results showed that older age is one of the main risk factors for both diseases. In conclusion, this work can contribute to helping health professionals design more effective strategies that can help to care and support patients who are affected by neurodegenerative diseases.

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