ORIGINAL ARTICLE

The Current Prevalence of Alzheimer's Disease and Related Factors in Individuals Aged 65 and over in Konya City Center of Türkiye

Türkiye'nin Konya İl Merkezinde 65 yaş ve Üzeri Bireylerde Alzheimer Hastalığının Güncel Prevalansı ve İlişkili Faktörler

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ABSTRACT

Aim: The prevalence of Alzheimer's Disease (AD) is unknown in many regions of our country. This study aimed to determine the prevalence of AD and its associated factors in the Konya city center located in the Central Anatolia region (Türkiye).
Methods: A study population of 240 subjects aged 65 and older was randomly selected from 14 family health centres. A face-to-face procedural interview, and neurological and psychiatric tests, including the mini-mental state examination, clock drawing score, basic and instrumental daily life activities, mental status examination, and geriatric depression scale, were performed. Co-morbidities, used drugs, risks, and protective factors were questioned.
Results: The average age was 71.5±5.8; 52.5% of them were male, and 47.5% were women. The prevalence of AD was 7.5%; 2.5% of them had mild, and 5% had advanced AD. While AD rates were higher in illiterate people and primary school graduates, it was lower in people with regular physical and mental activity. More abnormalities were found in general information, reasoning, abstraction, and executive functions in people with AD. As the daily and instrumental life activities deteriorated, the frequency of AD increased. Geriatric depression was higher in the AD group.
Conclusions: Türkiye is both a European and an Asian country and the locations of this study are urban areas of the Central Anatolian Region. Our prevalence was slightly higher than current data of European countries. The presence of AD was found to be associated with mental state abnormalities, deteriorated daily and instrumental life activities, and increased geriatric depression.

Keywords: Alzheimer's disease; prevalence; related factors; activities of daily living; geriatric depression

ÖZ

Amaç: Ülkemizin birçok bölgesinde Alzheimer Hastalığı (AH) prevalansı bilinmemektedir. Bu çalışmada İç Anadolu Bölgesi'nde (Türkiye) yer alan Konya il merkezinde AH prevalansının ve ilişkili faktörlerin belirlenmesi amaçlanmıştır.
Gereç ve Yöntemler: Çalışmaya 14 aile sağlığı merkezinden rastgele seçilen 65 yaş ve üzeri 240 kişi seçilmiştir. Yüz yüze görüşme proseduru ile, mini-mental test, saat çizme skoru, temel ve enstrümantal günlük yaşam aktiviteleri, mental durum muayenesi ve geriatrik depresyon ölçeği dahil olmak üzere nörolojik ve psikiyatrik testler yapıldı. Komorbiditeler, kullanılan ilaçlar, riskler ve koruyucu faktörler sorgulanmıştır.
Bulgular: Bireylerin ortalama yaşı 71.5 ± 5.8 idi; %52.5'i erkek, %47.5'i kadındı. AD prevalansı %7,5 bulundu; %2,5'inde hafif, %5'inde ileri AD vardı. Okuma yazma bilmeyenlerde ve ilkokul mezunlarında AD oranları daha yüksek, düzenli fiziksel ve zihinsel aktivite yapanlarda daha düşüktü. AD'li kişilerde genel bilgi, muhakeme, soyutlama ve yürütücü işlevlerde daha fazla anormallikler bulundu. Günlük ve enstrümantal yaşam aktiviteleri kötüleştikçe AD sıklığı artmakta idi. Geriatrik depresyon AD grubunda daha yüksekti.
Sonuçlar: Türkiye hem bir Avrupa hem de bir Asya ülkesidir ve bu çalışmanın lokasyonu İç Anadolu Bölgesi'nin kentsel alanlarıdır. Prevalansımız Avrupa ülkelerinin güncel verilerinden biraz daha yüksektir. AH varlığı mental durum anormallikleri, günlük ve enstrümantal yaşam aktivitelerinde bozulma ve artmış geriatrik depresyon ile ilişkili bulunmuştur.

Anahtar Kelimeler: Alzheimer hastalığı; prevalans; ilişkili faktörler; günlük yaşam aktiviteleri; geriatrik depresyon

Introduction

Alzheimer's Disease (AD) is a progressive neurodegenerative disease characterized by impairment of memory and cognitive functions, and inability in daily life activities (1). AD affects a significant segment of the population because it can lead to some psychosocial problems not only in the affected individuals but also in their caregivers and relatives. It is the most common form of dementia and makes up the vast majority of all dementia cases.

Although many risk and protective factors are discussed for disease, the most important risk factor is advancing age. The prevalence of AD is increasing exponentially every 5 years after age 65. The highest prevalence is in the eighth decade and above.

The prevalence of AD may differ by country and region. The estimated prevalence of dementia in 60-year-olds and over is 4.7% in Central Europe and up to 8.7% in North Africa and the Middle East. There has been an increase in Asia and Africa in the last few years. Population-based prevalence studies are inadequate, but the known prevalence of AD is 4.4%

in individuals aged 65 and older; the prevalence of all causes of dementia is 6.4% in Europe (2,3).

In our country, the prevalence of AD was reported at 10% in individuals aged 70 and older who live in Istanbul in the Marmara Region (4). However, the prevalence of AD or dementia is unknown in many regions of our country.

This study aimed to determine the prevalence of AD and its associated factors in the Konya city center in the Central Anatolia region.

Materials And Methods

Study Population

The study protocol was approved by the Local Ethical Committee (Decision No: 2016-599), and all patients or first-degree relatives signed written informed consent forms before enrolling in the study. The study was conducted under the principles of the Declaration of Helsinki.

The study was conducted in the Meram, Karatay, and Selçuklu, which are the towns of the Konya city center. The study population was determined by the Public Health and Medical Statistics Department of Necmettin Erbakan University according to scientific sampling methods. The sample size was found to be 240 with 80% power and 5% deviation, assuming the prevalence in 65-year-olds and older as an average of 10% (5). Two hundred forty subjects aged 65 and older were randomly selected from records of different 14 family health centers (FHC) in these three regions. All individuals in our country are registered to this FHC system. According to current data, the population of the Meram region is 344,500; the Karatay region is 339,000; the Selçuklu region is 662,000 persons, and the rate of the population ages 65 and over is 6,5% in these central districts. Therefore, 60 persons from the Meram and Karatay regions, respectively, and 120 persons from the Selçuklu region were included in the study. The Selçuklu region is known as the region with higher population density and higher education-income levels compared to the other two regions. In this way, the participants were from different socio-cultural and economic segments. The study was completed in one month.

Examination Tests

A face-to-face procedure interview, neurologic and psychiatric tests including Mini-Mental State Examination (MMSE), Clock Drawing Test (CDT)

score, Basic and Instrümental Activities of Daily Living (BADL and IADL, respectively), mental status examination, geriatric depression scale were performed. Additionally, demographic characteristics, co-morbidities, drugs used, risks, and protective factors for AD were questioned and recorded. These interrogations and tests took an average of 20 min for each individual.

The validated Turkish version (6) of the standardized MMSE (sMMSE) (7) and modified version of the sMMSE (sMMSE-il) for illiterate subjects (8) were used. The MMSE, the main evaluation test of this study, consisted of components including time and space orientation, memory recording, attention and calculation, recall, language, and drawing shapes; a total of 30 points were evaluated. A score of 24 points and above was determined to be normal, 18–23 was considered mild AD, and 17 and below was designated advanced AD.

In the CDT evaluation, a ready circle was given, correctly placed "12" was 3 points; if the numbers were correctly placed plus 1 point; if the hour and minute hands were correctly placed plus 1 point; and if the time was correctly marked plus 1 point.

Additionally, mental state examinations were performed, including general information, reasoning, abstraction, and executive functions, for example, from which direction does the sun rise? What do you do if you see a lost child? Name 10 objects that begin with the letter 'K' in 1 min?...

The following criteria of BADL, including eating, drinking, dressing-undressing, combing hair, shaving, walking, going to bed, getting up from bed, using the toilet, bathing, performing housework, going outside, shopping, and the presence of incontinence, and those of IADL (including: using the phone, traveling by vehicles, cooking, counting money, using medications), were questioned. There was one question for each activity, including eight questions about basic life activities and seven questions regarding instrumental life activities. These activities were evaluated as normal (0 points), incomplete (1 point), or complete (2 points) deterioration, and a score was calculated (9-13).

A Geriatrics Depression Scale with 30 questions was performed on the participants; 1 point was scored for each answer, and a total score of 0–10 is accepted as normal; 11–13 corresponds with mild depression;

14 and above means severe depression (14, 15).

Exclusion Criteria

The neuropsychiatric drug use and presence of neuropsychiatric disorders such as schizophrenia, psychosis, bipolar disorder, cerebrovascular events, and advanced Parkinson's were determined as exclusion criteria because these situations could affect the reliability of the tests. Also, advanced co-morbidities that disrupted living standards and quality, such as advanced cancer, cirrhosis, kidney, pulmonary and heart failure, blindness, and deafness, were excluded.

Statistical Analysis

All data were analyzed using SPSS statistics version 18 (SPSS Inc., Chicago, IL, USA). Non-categoric values were given as a mean ± SD. The student's t-test was used for the analysis of the normally distributed variables. Kruskal Wallis and Mann-Whitney tests were used for non-normally distributed variables. The Chi-square test was used for the comparison of categorical variables. A p<0.05 was considered statistically significant.

Results

Demographic Characteristics

Two hundred and fifty-nine people were interviewed to reach the target of 240 persons. Of these, 14 of them did not agree to participate in the study. Five participants were excluded due to exclusion criteria.

The average age of all participants was 71.5 ± 5.8 years (minimum: 65 years; maximum: 98 years). There were 126 males (52.5%) with a mean age of 72.2 ± 5.5 and 114 females (47.5%) with a mean age of 70.7 ± 6.1. There was no statistical difference in terms of gender and age (p>0.05, independent t-test). Of the participants, 185 were married (77%), and 55 (23%) were divorced or lost his/her partner. While 184 persons (76.7%) were in the middle-to-lower education levels, 56 persons (23.3%) were in the higher education levels. Sixty-seven persons (27.9%) had low-to-middle incomes, and 173 persons (72.1%) had high-income levels.

Co-morbidities

The most common co-morbidities were hypertension (57%), diabetes mellitus (30%), osteoarthritis (30%), hyperlipidemia (23.3%), osteoporosis (20.4%), coronary artery disease (18.8%), chronic obstructive pulmonary disease or asthma (16.7%), constipation (11.7%). Respectively, obesity, psychiatric and neurologic problems, cataracts, glaucoma, cancer history, and kidney-heart-liver diseases were less frequent. Benign prostatic hyperplasia was 26% in the males. The rates of co-morbidity were, generally, similar in both males and females. However, obesity, osteoporosis, and osteoarthritis were more common in females than the males (13.2 vs 6.3%, 40 vs 3.2%, and 41.2 vs 19.8%, respectively). Although smoking was more common in the males, obstructive pulmonary disease and asthma rates were similar in both sexes.

Drugs Use

Of the participants, 197 (92.1%) were receiving single or multidrug treatment due to chronic illnesses, and 43 (17.9%) did not have any medication used regularly. The most commonly used drugs were antihypertensive and cardiac medicine (58.8%), antiplatelet agents (acetylsalicylate and clopidogrel) (26.3%), oral antidiabetics (24.6%), non-steroidal anti-inflammatory drugs (15%), inhaler drugs (12.9%), antilipidemic (12.5%), stomach-protective medicines (proton pump inhibitors, antacids, alginate) (7.1%) and less frequently insulin, vitamin support preparations, neurological drugs, antidepressants, anticoagulants.

Mini-Mental State Examination

While the MMSE score was under 24 points in 18 persons out of 240 participants (7.5%), this score was 24 and above in 222 persons (92.5%). The MMSE score was 16.50 ± 0.83 in the advanced AD group, 20.91 ± 2.10 in the mild AD group, and 28.48 ± 1.59 in the normal group without AD.

While the mean age of individuals with AD was 80.2 ± 7.7, the mean age of non-AD individuals was 70.8 ± 5.1. The mean age of the persons with AD was higher (p<0.001, independent t-test).

The total AD rates were similar in the males and the females (6.3/8.8%, respectively); there was no statistical difference in gender (p=0.477, Chi-square test). Of the 12 persons with mild AD, 4 were female (33.3%), and 8 were male (66.6%). All the 6 advanced AD cases (100%) were female. The rates of AD according to the MMSE and distribution of AD according to age ranges are shown in Figures 1 and 2.
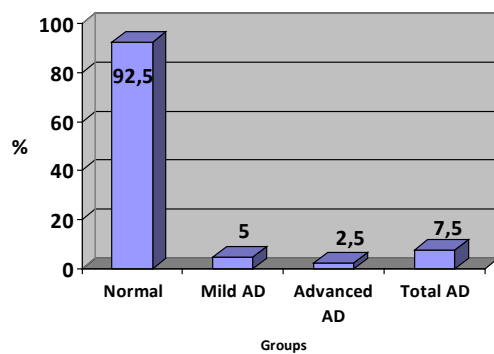
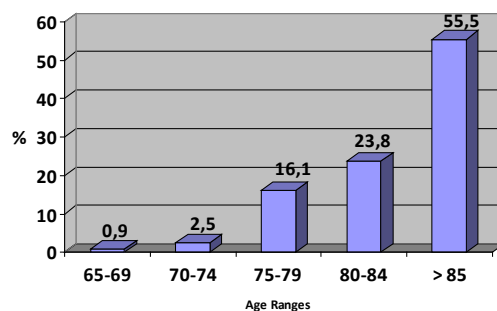**Figure 1.** The rates of AD according to MMSE

Figure 2. The distribution of AD according to age ranges

Additionally, the examination tests and related factors between AD and non-AD are displayed in Table 1.

Mental State Examinations

In our study, more abnormalities were found in mental state examinations, including general information, reasoning, abstraction, and executive functions in people with AD ($p<0.001$, Chi-square test, for each).

The people with advanced AD had more general information abnormalities than people with mild AD ($p=0.007$, Chi-square test). However, there was no statistically significant difference between persons with mild and advanced AD in point of reasoning, abstraction, and executive functional abnormalities.

Clock Drawing Scores

This score was a section where it was difficult to evaluate the functions because 30% of the study participants were illiterate, and 40% were primary school graduates. In particular, illiterate people said that they were unable to draw the clock (even if they could draw the shape in the MMSE). Some of them said that they could understand the time zone when they looked at the clock, but they could

not draw it. Since this test is a clock-drawing test, time zone information is not asked; only drawing a clock was requested. Therefore, the CDT score was not used to define the presence of AD. Considering this situation, 60.8% of the participants had 6 points, and 25% had 0 points. The mean CDT score was 1.0 ± 1.6 in persons with AD and 4.5 ± 2.4 in persons without AD. This score was statistically significantly lower in persons with AD compared to those without AD ($p<0.001$, Chi-square test).

Basic and Instrumental Activities of Daily Living

Generally speaking, in both groups with and without AD, it was found that IADL deteriorated more compared to BADL. Both BADL and IADL were more deteriorated in people with AD compared with those without AD ($p<0.001$, for each independent t-test). BADL mean scores in people with AD and without AD were 1.17 and 0.14, respectively. The IADL mean scores in people with AD and without AD were 6.83 and 0.35, respectively. In our results, as the BADL and IADL deteriorated (i.e. as the scores increased), the frequency of AD increased ($p<0.001$, for each, Chi-square test). There was no statistical difference between mild and advanced AD in terms of IADL and BADL scores ($p=0.123$; 0.055, respectively).

Geriatric Depression

According to the Geriatric Depression Scale, which includes 30 questions; 23 participants (9.6%) had definite depression (14 points and above), 23 participants (9.6%) had possible depression (11–13 points), and in 194 subjects (80.8%), depression was not detected (0–10 points).

Definite or possible depression was detected in 8 of 18 (44.4%) people with AD and 382 of 222 (20.6%) people without AD. Seven of these 8 depressions in patients with AD were definite depression. People with AD had significantly higher geriatric depression compared with people without AD ($p<0.001$, Chi-square test).

Additionally, depression was higher in the females than in the males (27.2% and 11.9%, respectively; $p=0.003$, Chi-square test). According to our study results, the depression rate was higher in illiterate and primary school graduates (48.6% vs 25.3%). As the level of economic income decreased, the rate of possible and definite depression increased (54% in low-income vs 27.6% in middle-high income).

AD and Socio-economic Levels

In those people with AD (n = 18), 10 persons (55.5%) were illiterate, 6 persons (33.3%) were primary school graduates, 1 person (5.5%) was a junior-high-school graduate, and 1 person (5.5%) was a university graduate. Of the people with AD, 88.8% were illiterate and primary school graduates, 11.2% were middle and high school graduates. Alternatively, of the people without AD, 67.1% were illiterate and primary school graduates and 32.9% were middle and high school graduates.

Out of the people with AD (n=18), 3 persons (16.6%) had very low income, 6 persons (33.3%) had low income, and 9 persons (50%) had middle income. None of the high-income people had AD.

The proportion of AD was 33.3% among individuals with very low economic income. This rate was 10.3% for low-income individuals, 6.1% for middle-income individuals, and 0% for high-income individuals. Namely, as the economic income level increased, the rate of dementia decreased. Statistically, individuals from very low-income families had higher AD rates (p=0.008, Chi-square test).

AD and Habits

In terms of regular physical and mental activity, while the AD rate was 1,6% in people who had regular activities, this rate was 13.7% in people without an activity. The rate of AD was lower in people with regular physical and mental activity (p<0.001, Chi-square test)

In our study, there was no statistical relationship between the frequency of AD and smoking-alcohol use, head trauma, and toxin exposure history.

The individuals were questioned about diet types including balanced, vegetable weighted, meat weighted, pastry weighted, oily, and carbohydrate-rich. There was no statistical relationship between dietary types and AD frequency. Nine persons with AD were eating twice daily, seven persons were three times, and two persons were more than three times. A total of 76,5% of persons without AD were eating three times or more per day. The number of daily meals in persons with AD was statistically lower than that in persons without AD (p<0.001, Chi-square test). The persons with AD had more sleep disorders compared with persons without AD (50% vs 34.6%, p=0.03, Chi-square test). Of the18 AD cases, decreased sleeping was noted in 6 persons, and increased sleeping was present in 3 persons.

AD and Co-morbidities and/or Drugs

The osteoporosis rate was 38.8% in persons with AD, while this rate was 18.9% in persons without AD. This difference was statistically significant (p=0.043, Chi-square test), and the situation can be explained by the fact that patients with AD were older. There was no statistically significant relationship between AD frequency and other co-morbidities except osteoporosis. The rate of osteoarthritis was 50% in persons with AD and 28.3% in persons without AD, but it was not statistically significant (p=0.052, Chi-square test).

Similarly, there was no statistical correlation between AD and drugs such as antihypertensives, cardiac, antiplatelets, oral antidiabetics, non-steroidal anti-inflammatory drugs, inhalers, antilipidemic, gastroprotective agents, insulin, vitamins, anticoagulants, and cancer chemotherapeutics.

Tablo 1. The examination tests and related factors between AD and non-AD

Parameters	AD (n=18)	Non-AD (n= 222)	p
Age (years)	80.2 ± 7.7	70.8 ± 5.1	<0.001
Gender (E/F)	8 / 10	118/ 104	0.477
Mean MMSE score	19.4	28.4	<0.001
Mean CDT Score	1.0 ± 1.6	4.5 ± 2.4	<0.001
General Information Abnormalities (%)	16.6	1.35	<0.001
Reasoning Abnormalities (%)	16.6	0.45	<0.001
Abstraction Ability Abnormalities (%)	38.8	9.9	<0.001
Executive Function Abnormalities (%)	77.7	13.0	<0.001
Mean BADL Score	1.17 ± 1.50	0.14 ± 0.35	<0.001
Mean IADL Score	6.83 ± 4.70	0.35 ± 1.18	<0.001
Depression Rate (%)	44.4	20.6	<0.001
Low Education Level (%)	88.9	67.1	0.055
High Educational Level (%)	11.1	32.9	
Low Economic Income (%)	50	26.1	0.03
Middle-High Economic Income (%)	50	73.9	
Smoke Use / Active or History (%)	22.2	39.1	0.154
Alcohol Use / Active or History (%)	-	2.2	0.520
AD Family History (%)	11.1	10.3	0.920
Head Trauma History (%)	11.1	8.1	0.658
Chronic Toxin Exposure (%)	-	1.3	0.620
Regular Physical Activity (%)	11.1	54.5	<0.001
Regular Lifestyle (%)	22.2	64.4	<0.001
Osteoporosis Rate (%)	38.8	18.9	0.043
Osteoarthritis Rate (%)	50	28.3	0.054
Sleep Disorders (%)	50	34.6	0.03

MMSE: Mini-Mental State Examination, CDT: Clock Drawing Test, BADL and

IADL: Basic and Instrumental Activities of Daily Living, AD: Alzheimer's Disease

Discussion

There are limited studies on the prevalence of AD in Türkiye, and this study is important because it is the first study to investigate the prevalence of AD in our region. In addition, this study has the power to reflect the prevalence in the region because the Konya Province is one of the largest provinces in the Central Anatolia Region.

According to our study results using the MMSE for standardized and illiterate persons (6, 8), the prevalence of AD in the Konya city center was 7.5%, where 5% of them had mild AD, and 2.5% had severe AD.

As expected, as the age increased, the rate of AD was also increasing. When we evaluated it according to age ranges, there was a significant increase in AD rates, especially in individuals over 75 years of age.

In meta-analyses of prevalence studies, the prevalence of AD has been reported as 4–5% in 65–70-year-olds and up to 40% in the 75 to 85 age range. The highest prevalence is in the eighth decade. Our results are close to the results of this meta-analysis. The incidence of AD in men and women was similar and did not show gender differences.

The AD rate of our study (7,5%) was lower than that of the study by Gurvit H et al., which was performed in Istanbul's Kadikoy region in Türkiye. They reported the rate of AD as 11% and the rate of dementia as 20% (4). Their study results were also above European data, but their study included a population of 70-year-olds and over. Furthermore, another feature of the study was that it consisted of two phases. The first phase was similar to our study on dementia screening with MMSE. The second phase was to determine the subtypes of dementia by performing diagnostic studies for those with dementia.

In a former Italian study with a similar methodology, which was designed in 2 phases, the prevalence of dementia for individuals over 59 years of age was reported as 6.2%; 2.6% of dementia was AD, 2.2% was multi-infarct, 0.8% was mixed dementia, 0.4% was secondary dementia, 0.3% of unspecific dementia. In this study, the prevalence of dementia was 8.4% in individuals over the age of 64. The Hodkinson

mental test, used to validate the Italian study as a screening test, was utilized in this study (16).

In the Korean study, conducted using the Korean version of the MMSE test, the prevalence of dementia was 9.5% in rural areas for people over 65 years old. The authors commented that this ratio was similar to Western countries. In this study, mild AD prevalence was reported as 3.4%, moderate AD prevalence was 0.7%, and advanced AD prevalence was 0.5% (17). In urban areas of Korea, dementia prevalence was reported as 6.3%, AD prevalence was 4.8%, vascular dementia prevalence was 1%, and Lewy body dementia was found to be 0.4% in the KLoSHA study that included 1118 randomly selected individuals (18). Considering the results of these 2 Korean studies, while the prevalence of dementia in Korea's rural areas was 9.5%, it was 6.3% in urban areas, and thus the prevalence of dementia in rural areas was higher than in urban areas. This may be related to their educational and income levels.

In a Chinese study that investigated dementia and its subtypes, the Chinese version of MMSE was used, and the rates of dementia have been reported to be lower than those in European countries. The prevalence of phase 1 dementia has been reported as 2,6% for individuals over 60 years old and 3.4% for individuals over 65 years old. According to the results of Phase 2, the prevalence of AD was 1.85% in patients over 65; the prevalence of vascular dementia was 1.3%; others were reported as 0.2% (19).

A recent European meta-analysis (20) reported that the prevalence of AD was 6.88% in southern European countries (Spain, Italy, and Greece) and 4.31% in northern European countries (France, Netherlands). The mean prevalence of AD in Europe was 5.05%. Prevalence was 3.31% in men and 7.13% in women and it was increasing with age in this report.

Türkiye is both a European and an Asian country and the locations of this study are urban areas of the Central Anatolian Region. Our prevalence was slightly higher than current data of European countries.

Although AD is the most common form of dementia, our study's limitation was that other subtypes of dementia were not separated. Another limitation of our study is that MMSE was considered a screening tool for AD and not a completely reliable test for

AD diagnosis, thus inducing misclassification of the outcomes. Another more reliable diagnostic tool than the MMSE could be utilized, for example, the Cambridge Cognitive Examination. However, we preferred the MMSE because it is a practical test that is widely used for screening in similar studies.

Our study was managed in terms of demographic features and related factors; although the mean age was similar in all three towns, the rate of AD was higher in the Meram region. A total of 88.8% of persons with AD were illiterate and primary school graduates. Illiteracy has been reported independently associated with a higher risk of prevalent and incident dementia, but not with a more rapid rate of cognitive decline (21). It has been reported that low educational levels are associated with dementia (22) and high educational levels protective from AD (23) in different studies. Additionally, the AD rate was higher in those with very low incomes. Some studies reported that the AD rate is also related to occupations (22). There was no statistically significant difference between dietary types and AD frequency, but the number of daily meals was lower in persons with AD. Persons with AD had more sleep disorders, especially insomnia. Osteoporosis was statistically higher in the AD group. Although not statistically significant, the rate of osteoarthritis was higher in persons with AD. Other comorbidities were similar in both groups. While there was a positive relationship between the frequency of AD and low activity, there was no correlation with other risk factors such as family history, smoking and alcohol use, depression, head trauma, and toxin exposure. The frequency of AD was less in the subjects who reported regular physical and mental activities and regular life history.

The most important method to distinguish vascular dementia in older patients is imaging methods. In addition to imaging, some co-morbidities and medication use are parameters that may indicate vascular dementia in terms of predisposition to atherosclerosis (24). In our study, there was no statistical relationship between the frequency of dementia and the presence of hypertension, diabetes mellitus, hyperlipidemia, coronary artery disease, or use of antihypertensive, antilipidemic, antiplatelet, anticoagulant, insulin, oral antidiabetic, cardiac drugs. The fact that AD and non-AD groups are similar in this respect may support the fact that

vascular dementia is not prominent in the AD group.

In our study, individuals with AD had more deterioration in BADL and IADL. In other words, cognitive dysfunction was associated with impairments in daily activities. Similarly, clock drawing scores were lower in people with AD. Mental examinations, including general knowledge, reasoning, abstraction, and executive functions, were worse in individuals with AD. There was a positive relationship between definite depression and AD frequency in our study. However, it is difficult to distinguish whether this depression is related to AD or older age depression because, while dementia cases did not differ in men and women, depression was more common in women. The relationship between dementia and depression was not an unexpected finding since neuropsychiatric symptoms are common in AD. This may manifest itself in the form of behavioral and psychiatric symptoms. Sometimes depressive symptoms may be the first sign of AD, but this situation is difficult to distinguish from older age depression. In such cases, not responding to standard depression treatments may be stimulating in AD.

Conclusion

As a result, this study has revealed the current prevalence of AD and its related factors in the Central Anatolia region of Türkiye. Estimating the prevalence of the disease will make important contributions to the development of health policies. Considering the relative decrease in the young population and the increase in the geriatric population all over the world, it can be predicted that the prevalence of dementia and AD may increase in the coming years.

Conflict of Interest

All authors declared that no conflict of interest between them and all authors had access to the data and played a role in writing this manuscript.

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