

Is Polypharmacy Risk Factor for Insomnia Later in Life? A Cross-Sectional Study in Greece

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Abstract

Introduction: Insomnia is among the most pervasive and poorly-addressed problem of aging. The purpose of the present study was to estimate the prevalence of insomnia among older patients who visit Health Center of Distomo, Greece and to associate with several risk factors.

Methods: A cross-sectional study was conducted among 150 elderly, aged > 65 years. An anonymous questionnaire was designed to collect the basic demographic data of the study population. The Athens Insomnia Scale (AIS) was used to quantify sleep disturbances. Statistics was processed with SPSS 22.

Results: According to AIS, 39.3% of the older people screened positive for insomnia. Sleep problems were more frequently in women ($p = 0.002$), in older age ($p < 0.001$), in elderly suffering from medical conditions ($p < 0.05$), in participants with poor social life ($p = 0.011$), with absence of daily physical activity ($p < 0.001$) and in those with daily coffee and alcohol consumption ($p = 0.016$ and $p = 0.041$ respectively). The polypharmacy ($p < 0.001$) and especially the consumption of diuretics ($p = 0.007$) and more than two antidepressants ($p < 0.001$) was strongly associated with insomnia.

Conclusion: According to our results insomnia is often among the elderly and strongly associated with several risk factors such as polypharmacy and comorbidity. Various interventions in Primary Health Care are necessary in order to increase detection rates of sleep disorders in older people.

Keywords: Sleep; Aging; Insomnia; Athens Insomnia Scale (AIS); Polypharmacy

Introduction

The rapid increase in the numbers of older adults worldwide makes a focus on mental disorders and aging both timely and imperative. Eurostat findings support that approximately an 18% of the European Union population are aged over 65 years old and is estimated to reach 28% by 2060 [1].

Insomnia and sleeping difficulty are among the most pervasive and poorly- addressed problems of aging and it's often associated with other age-related conditions and has negative effect on cognition and mortality [2]. It is estimated that 40-70% of older people suffer from sleep problems [3].

On the other hand, there are physiological changes in sleep architecture with aging that are not, in themselves, pathologic, such as advanced bedtimes and rise times, longer sleep-onset latency, shorter overall sleep duration, sleep fragmentation, reduced slow wave sleep (SWS), increased NREM 1 and 2 and reduced NREM-REM sleep cycles. The result can be an increase in daytime naps [4,5].

Sleep difficulties later in life are significantly associated with medical and psychiatric comorbidities (anxiety, depression, diabetes, chronic obstructive pulmonary disease or arthritis) and the presence of multiple medical conditions has been found to be detrimental to sleep quality. Other risk factors associated with insomnia in the elderly are polypharmacy, different classes of medications, female gender, the age, loneliness and the lower economical or educational level [6,7].

Materials and Methods

We conducted a cross-sectional study from December 2018 to February 2019, among 150 elderly, aged > 65 years who visit Health Center of Distomo, Greece. Our purpose was to estimate the prevalence of insomnia among these older patients and to associate with several risk factors.

An anonymous questionnaire was designed to collect the basic demographic data of the study population. The Athens Insomnia Scale (AIS-8 items) a self-assessment psychometric instrument, was used to quantify sleep difficulty. Each item of the scale is rated from 0 to 3 (0: no problem and 3: serious problem). Scores ≥ 6 indicate diagnosis of insomnia [8].

SPSS statistical software (version 22; SPSS Inc) was used to analyze the data using descriptive, frequency, correlate, and comparison statistics. A P value less than .05 was considered statistically significant. Variables showing, at univariate analysis, a statistically significant association with insomnia were introduced in a multivariate model in order to evaluate the association for a number of potential confounders and effect modifiers such as age; gender; education; financial level; marital status; having children; a number of illnesses; polypharmacy (defined as taking five or more medications) and different classes of medications.

Results

Table 1 present the demographic data of the studied population.

According to AIS, 39.3% of the older people screened positive for insomnia.

Sleep problems were more frequently in women ($p = 0.002$), in older age ($p < 0.001$), and in elderly suffering from medical com-morbidities such as arrhythmia ($p = 0.015$), heart and respiratory (COPD) failure ($p = 0.002$ and $p < 0.001$ respectively) and frequent urination ($p = 0.044$).

Moreover, sleep difficulties were more frequent in participants with poor social life ($p = 0.011$), with absence of daily physical activity ($p < 0.001$), in housekeepers and in those with daily coffee and alcohol consumption ($p = 0.016$ and $p = 0.041$ respectively).

Last but not least, an interesting finding was observed whereas the polypharmacy (Table 2) and especially the consumption of diuretics ($p = 0.007$) and more than two antidepressants ($p < 0.001$) was strongly associated with insomnia too.

Discussion

One in four older participants estimated to suffer from insomnia. Many studies documenting the epidemiology of sleep complaints in older adults have shown that it is common in this age group with the prevalence rate of insomnia ranging from 30% to 60% [9-11].

Characteristics	N or %
Total recorded participants	150
Male (%) / female (%)	44.7 / 55.3
Mean age in years ± SD	71 ± 8.1
Nationality	
Hellenic / other (in %)	99.3 / 0.7
Educational level	
Low (1-6 years) / Medium (7-12 years) / High (>12 years) (in %)	78.0 / 12.66 / 9.33
Financial level	
< 500 E / 501-1000 E / 1001-2000 E / >2001E (in %)	1.3 / 32.0 / 62.7 / 4.0
Marital status	
Married / Not married / Divorced / Widowed (in %)	72.0 / 3.3 / 3.3 / 21.3
Children	
Yes / No (in %)	95.3 / 4.7
Place of Living	
Urban / Rural (in %)	10.0 / 90.0
Co-morbidity	
Yes / No (in %)	100 / 0.0
Medications	
Yes / No (in %)	99.3 / 0.7
Mean number of medications ± SD	5 ± 3

Table 1: Sociodemographic characteristics of the sample (N = 150).

Insomnia (AIS)	N	Mean	SD	t	df	Sig. (2-tailed)
Number of Medications	Yes	59	6.07	3.867	148	.000
	No	91	4.51			

Table 2: Associations between number of medications and Athens insomnia scale (AIS).

In the present study, specific variables referring to the elder’s sociodemographic profile affect the quality of sleep. The findings support evidence in the literature suggesting that sociodemographic factors may to some extent contribute to the explanation of insomnia. In details, the results of the studies performed indicates that female gender, and age are strongly associated with insomnia, as well as psychosocial factors. Moreover, lower education level and poor physical health including illness and disability seem to put elders at risk for sleep difficulties [7,10,11]. The aging process is commonly associated with multiple pathological problems that can affect sleep and the accumulation of comorbidities is one of the major issues leading to a higher risk of sleep disturbances among the elderly [12].

Polypharmacy and specific classes of medications are strongly associated with insomnia, with diuretics and antidepressants to affect mostly the quality of sleep. According to the literature, the use of prescription medications and over-the-counter medications is on the rise in this age group. In many cases there is no consideration of the effect of medications on the patients’ sleep. Many of the medications

that are prescribed for chronic medical and psychiatric conditions can also contribute to, or even cause, insomnia, such as central nervous system stimulants (e.g. modafinil), antihypertensives, diuretics, respiratory medications (e.g. theophylline) and chemotherapy [13,14]. Moreover, commonly prescribed selective serotonin uptake inhibitors and tricyclic antidepressants may impair sleep continuity, total sleep time, and cause nightmares or especially vivid dreams [15,16].

Conclusion

Insomnia is often among the elderly of the present study and strongly associated with several risk factors such as polypharmacy and comorbidity. Various interventions in Primary Health Care are necessary in order to increase detection rates of sleep disorders in older people. Early identification and treatment of inadequate sleep in elderly can positively influence medical outcomes and quality of life. Following a logical prescribing process of medications may also contribute in the prevention of insomnia later in life.

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Conflict of Interest

The authors declare that they have no competing interest.

Bibliography

1. European Commission. "Directorate General for Economic and Financial Affairs. The 2015 Ageing Report: Underlying Assumptions and Projection Methodologies". European Economy (2014).
2. Ancoli-Israel S. "Sleep and its disorders in aging populations". *Sleep Medicine* 10.1 (2009): S7-S11.
3. Avidan AY. "Normal Sleep in Humans". In: Kryger Meir HAAY, Berry Richard B editors. Atlas of Clinical Sleep Medicine. Second. Philadelphia, PA: Saunders (2014).
4. Mander BA., et al. "Sleep and Human Aging". *Neuron* 94.1 (2017): 19-36.
5. Ohayon MM., et al. "Meta-analysis of quantitative sleep parameters from childhood to old age in healthy individuals: developing normative sleep values across the human lifespan". *Sleep* 27.7 (2004): 1255-1273.
6. Neikrug AB and Ancoli-Israel S. "Sleep disorders in the older adult. A mini-review". *Gerontology* 56.2 (2010) 181-189.
7. Smagula SF., et al. "Risk factors for sleep disturbances in older adults: Evidence from prospective studies". *Sleep Medicine Reviews* 25 (2016): 21-30.
8. Soldatos CR., et al. "Athens Insomnia Scale: validation of an instrument based on ICD-10 criteria". *Journal of Psychosomatic Research* 48.6 (2000): 555-560.
9. Ohayon MM. "Epidemiology of insomnia: what we know and what we still need to learn". *Sleep Medicine Reviews* 6.2 (2002): 97-111.
10. Argyropoulos K., et al. "Sleep disorders and association with depression in members of a day care center for elderly in Tripolis, Greece". *European Psychiatry* 29.1 (2014): 1.
11. Argyropoulos Konstantinos and Evangelia Machini. "Adherence to Mediterranean diet and risk of depression later in life. A cross sectional study in East Attica, Greece". *Global Psychiatry* 2.2 (2019): 201-209.

12. Barczy SR and Teodorescu MC. "Psychiatric and Medical Comorbidities and Effects of Medications in Older Adults". In: Kryger MH, Roth T, Dement WC editors. *Principles and Practices of Sleep Medicine*. 6th. Philadelphia, PA: Elsevier (2016).
13. Foral P, *et al.* "Medication-induced sleep disturbances". *Consultant Pharmacist* 26.6 (2011): 414-425.
14. Pagel JF and Helfter P. "Drug induced nightmares-an etiology-based review". *Human Psychopharmacology* 18.1 (2003): 59-67.
15. Tribi GG., *et al.* "Dreaming under antidepressants: a systematic review on evidence in depressive patients and healthy volunteers". *Sleep Medicine Reviews* 17.2 (2013): 133-142.
16. Mathews M., *et al.* "Mirtazapine-induced nightmares". *Primary Care Companion to the Journal of Clinical Psychiatry* 8.5 (2006): 311.

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