ORIGINAL RESEARCH PAPER
Volume-6 | Issue-11 | November-2017 | ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PREVALENCE OF INSOMNIA AND ITS ASSOCIATED FACTORS AMONG GERIATRIC POPULATION IN AN URBAN AREA OF DELHI, INDIA.

Medicine

Dr. Amit Kumar	Quarter no. 16, Type -3, Police colony, Police Station, Jagat Puri, Delhi-110051.
Dr. Bratati Banerjee	Department of community medicine, 4th floor, pathology block, Maulana Azad medical College, New Delhi -110002
Dr. Piyush Kumar Gupta	Room no. 41, PG Mens Hostel , Maulana Azad medical college campus, New Delhi -110002
Dr. Saket Parashar	Room no. 90, PG Mens Hostel , Maulana Azad medical college campus, New Delhi -110002
Dr. Dalveer Singh	Room no. 41, PG Mens Hostel , Maulana Azad medical college campus, New Delhi -110002
Vijeta Kamboj Ujjainia	Quarter no. 16, Type -3, Police colony, Police Station, Jagat Puri, Delhi-110051

ABSTRACT

Introduction: Insomnia refers to the difficulty in initiation, maintenance, duration or quality of sleep. People may experience poor concentration, lower productivity and poorer work quality.
Objective: To estimate the prevalence of insomnia and its association with socio-demographic factors and co-morbidities among elderly.
Materials and Methods: A cross sectional study conducted among geriatrics in an urban area of Delhi. Data was collected using a semi structured pre tested interview schedule based on a validated insomnia-screening tool. Data was analyzed for any association between insomnia and socio-demographic factors.
Results: Out of 450 subjects, 110 were found to have insomnia and associated with increasing age, general health problems and endocrine problems.
Conclusion: Prevalence of insomnia was 24.4% and associated with few risk factors.

KEYWORDS

insomnia, geriatric, urban

Introduction

Insomnia refers to the difficulty in initiation, maintenance, duration or quality of sleep. People may experience poor concentration, lower productivity and poorer work quality as a result of insomnia.[1]

Several demographic risk factors for insomnia like age and gender have been identified. There is higher prevalence of insomnia among women and elderly. While the cause of this increased risk in the elderly is not well defined, it may be due to the partial decline in functionality of sleep mechanism that may contribute to insomnia in older population. Importantly, the presence of co-morbid medical conditions is also a significant contributor to the increased prevalence of insomnia in the elderly. Co-morbid medical disorders, psychiatric disorders represent significant risks for insomnia. It is important to determine factors that may be associated with insomnia.[2] The present study was carried out to estimate the prevalence of insomnia and study the association between insomnia and socio-demographic factors and co-morbidities among elderly population in an urban area in Delhi India.

Material and Methods:

It was a community based cross-sectional study, conducted from January to December 2015 in an urban resettlement colony in Delhi. Total population size of the area was 23,187.

The study constituted the individual 60 years and above, However those individuals, who were already diagnosed with insomnia or were severely ill / bedridden, mentally deranged and those who were unable to give voluntary consent were excluded.

At 95% confidence level and taking the prevalence of insomnia[3] to be 50 % and with a relative error of 10 % the sample size was calculated as 400 using the formula. Addition 10% was added for possible incomplete responses, the sample size calculated was 440 which were rounded off to 450.

Sampling of households was done. There were 2404 households in the area, thus making an average of 10 members in each household. Considering 10% of the population to be elderly, it was expected to have at least one elderly person in each household. Hence 450 houses were selected by simple random sampling using random number table. If there were more than one eligible subject in a single house, lottery method was used to select one subject. In case there was no eligible subject in selected house, the immediately adjacent house with at least one eligible subject was selected. All attempts were made to contact the eligible person. If it was not possible to contact them even after 3rd visit, next eligible subject was selected without disturbing the overall sampling technique.Written informed consent were taken from all study subjects. Ethical clearance was obtained from Institutional Ethics Committee.

A pretested, semi structured interview schedule containing items on socio-demographic profile of the subjects was used for data collection. Data was also collected for health profile and co-morbidities present among study subjects. Available medical records were also checked. Insomnia was screened using Insomnia-screening questionnaire developed by a Clinical Practice Guideline Working Group based on Canadian expert and primary care physician consensus.[4] This is a screening tool used to guide the physician in the clinical evaluation of insomnia. It has six diagnostic domains: insomnia (Q1–6), psychiatric disorders (Q7–10), circadian rhythm disorder (Q11) movement disorders (Q12 and Q13), parasomnias (Q14) and sleep disordered breathing/sleep apnoea (Q15–17). Each question in each domain had a sliding scale of response between 1 and 5, with 1 = never, 2 = rarely, 3= occasionally, 4 = most nights/days, and 5 = always. According to this screening tool, a person was considered to have "insomnia" if the answer was 3, 4 or 5 on two or more of the insomnia domain questions (Q1–6) and had significant daytime impairment. A person was considered to have "likelihood of insomnia" if the answer was 3, 4, or 5 on any question from Q1–6. Morbidity profile was assessed based on presenting complaints (if any), history of illness and available medical records. The tool was translated into local language by experts and then back translated to English by translators to check for its validity. Pre testing was done in similar setting and suitable modifications were done afterwards. The collected data was entered in MS-Excel and

analyzed using SPSS- 17 version. A *p* value of <0.05 was taken as statistically significant. Univariate analysis was done and among those factors which were found significant, multivariate analysis was done subsequently.

Result

Total 450 elderly subjects aged 60 years and above participated in the study. Out of that, 46.7 % were male and 53.3 % were females. Around 68.3 % female and 53.3% male belonged to young old age group (60-69 years).

Around 61.3% of the total population were married and living with their partners while 38.7 % was living without their spouse who was widow, widower, divorced or unmarried.

Nearly equal percentage of males (58%) and females (60%) were living in joint family structure. Illiteracy level was higher in females (92.5%) as compared to males (47.6%).

More than half (56.5%) of the total study population were not working. In the current working status 20.9 % of males and 60.3% of females were reported to be involved in work. Nearly sixty percent (59.5%) of total population belonged to upper lower class and 28.8% belongs to lower class according to Modified Kuppuswamy Classification.[5]

Table.1 Prevalence of insomnia and other sleep disorders

		Male n= 210 (%)	Female n= 240 (%)	Total n= 450 (%)	χ2 value, d.f, p value
Insomnia	Yes	46 (21.9)	64 (26.6)	110 (24.4)	1.37,1, 0.241
	No	164 (78.1)	176 (73.4)	340 (75.6)	
Likelihood insomnia	Yes	24 (11.4)	24(10.0)	48 (10.6)	0.240,1, 0.624
	No	186 (88.6)	216 (90.0)	402 (89.4)	
Parasomnias	Yes	2 (0.9)	8 (3.3)	10 (2.0)	2.92,1, 0.087α
	No	208 (99.1)	232 (96.7)	440 (98.0)	
Sleeping breathing disorder	Yes	0 (0.0)	2 (0.8)	2(0.4)	1.758,1, 0.185α
	No	210 (100.0)	238 (99.2)	448 (99.6)	

Figures in parenthesis shown column wise percentages. -α Fischer's exact test applied, No cases were observed for psychiatric, circadian and movement disorders.

As shown in Table 1, out of 450 subjects, 110 were found to be having insomnia. Hence the prevalence of insomnia estimated to be 24.4% in the study population. Higher proportion of females (26.6%) were affected with insomnia as compared to males (21.9%) but the difference was not statistically significant (p >0.05).

Table.2 Relationship between insomnia and socio demographic factors

	Insomnia					Overall
Socio demographic factor	**Male n (%)**	**χ2 value, d.f, p value**	**Female n (%)**	**χ2 value, d.f, p value**	**Total n (%)**	**χ2 value, d.f, p value**
Age (years)		26.97, 2 .001*		1.18,2, .553		13.3, 2, .001*
60-69	12 (10.7)		46 (28.0)		58 (21.0)	
70-79	22 (28.2)		14 (21.9)		36 (25.3)	
≥80	12 (60.0)		4 (33.3)		16 (50.0)	
Marital Status		11.75, 1 .001*		.038,1, .845		4.54, 1, .033*
Living with spouse	28 (16.9)		30 (27.3)		58 (21.0)	
Not living with spouse	18 (40.9)		34 (26.2)		52 (29.8)	
Type of family		3.95, 2 .139		3.26,2, .195		.214,2, .899
Joint	24 (19.7)		40 (27.8)		64 (24.0)	
Nuclear	16 (21.6)		20 (30.3)		36 (25.7)	
Other	6 (42.9)		4 (13.3)		10 (22.7)	
Total	46 (21.9)		64 (26.6)		110 (24.4)	
Literacy		3.27, 1 .195		.197, 1 .658		1.42, 1, .490
Illiterate	18 (18.0)		60 (27.0)		78(24.2)	
School	28 (26.4)		4 (22.2)		32(30.1)	
Occupation		4.05, 3 .132		.749, 3 .862		2.14, 3, .544
labour	4 (11.8)		6 (27.3)		10 (17.8)	
Skilled labour	4(40.0)		0 (0.0)		4 (33.3)	
Homemaker	0 (0.0)		34 (26.6)		34(26.5)	
Not working	38 (22.9)		24(27.3)		62 (24.4)	
Socio Economic Status		3.07, 3 .380		5.46, 3 .141		.647, 3, .886
Lower	12(30.0)		22 (24.4)		34 (26.1)	
Upper lower	28 (20.6)		34 (25.8)		62 (23.1)	
Lower middle	4(14.3)		8 (50.0)		12 (27.7)	
Upper middle	2 (33.3)		0(0.0)		2 (25.0)	

Figures in parenthesis show percentages in respective groups.

Table 2 shows higher prevalence of insomnia with increasing age. Those aged more than 80 year (50.0%) followed by 70-79 years group (25.3%) and 60-69 year (21.0%), which was significantly associated (p<0.05). Prevalence was more in subjects living without spouse (29.8%) than subjects living with spouse (21.0%) and statistically significant too (p<0.05). No significant association was observed with literacy, occupation and socio economic status of study subjects. (Table 2)

Table.3 Association between Insomnia and co morbidities among study subjects

Insomnia	**Overall**				
Morbidity	Male n (%)	χ2 value, d.f, p value	Female n (%)	χ2 value, d.f, p value	χ2 value, d.f, p value
General problems	8 (25.0)	.211,1, 0.646	16 (42.1)	5.50,1 .019*	4.34,1 .037*
Respiratory	5 (27.8)	.397,1, 0.529	3 (13.6)	2.10,1 .147	.470,1 .493
Gastro intestinal	5 (19.2)	.124,1, .725	9 (30.0)	.195,1 .659	.011,1 .918
Skin	2 (33.3)	.472,1, .492	0 (0.0)	1.47,1 .224	.109,1 .741
Endocrine	12 (50.0)	12.50,1, .001*	16 (40.0)	4.36,1 .037*	15.0,1 .001*
Cardiovascular	12 (20.7)	.069,1, .793	16 (28.6)	.136,1 .713	.001,1 .973
Ear Nose Throat (ENT)	16 (38.1)	8.04,1, .005*	12 (30.0)	.273,1 .602	5.11,1 .024*
Eye	26 (38.2)	15.67,1, .001*	24 (24.0)	.623,1 .430	4.10,1 .043*
Musculoskeletal	12 (60.0)	18.75,1, .001*	6 (13.0)	5.40,1 .020*	.335,1 .563
Dental problem	42 (21.9)	.001,1, .973	54 (25.0)	3.06, 1 .080	1.98,1 .159
Neurological	2 (20.0)	.002,1, .881	0 (0.0)	-	.109,1 .741

No cases for urinary system in insomnia cases

Table 3 shows that general problems, endocrine morbidities, ear nose throat (ENT) and eye problems were significantly associated with insomnia (p<0.05). (Table 3)

Table.4 Multivariate logistic regression analysis of associated factors of insomnia

Factors/ characteristics	Ref	Exp(β)/ odds ratio [95% CI]	P value
Age			
60-69year	1		

70-79year		.304 [.134 - .687]	.004*
≥ 80year		.327 [.143 - .747]	.008*
Marital status			
Living with spouse		.690 [.430 - 1.106]	.123
Living without spouse	1		
Endocrine			
Yes		3.348 [1.879 – 5.964]	.001*
No	1		
General problems			
Yes		1.902 [1.065- 3.397]	.030*
No	1		
Ear Nose Throat			
Yes		1.282 [.709- 2.317]	.410
No	1		
Eye			
Yes		1.407 [.878- 2.255]	.096
No	1		

Table 4 shows that after adjusting for age, marital status, general problems, ENT, Eye and endocrine morbidities, independent factors for insomnia were: Age 70-79 years [OR= .304, CI: .134- .687], Age ≥ 80 years [OR= .327, CI: .143- .747], Endocrine system morbidity [OR= 3.348, CI: 1.879 – 5.964] and General problems [OR= 1.902, CI: 1.065- 3.397].

Discussion

The prevalence of insomnia in the present study was observed to be 24.4%. This was higher than that reported in previous studies conducted by Kasthuri et al [6], (13.04%). Liu X et al[7] (8.9%) and Tung et al[8] (6%). While it was observed to be lower than that in the study conducted by Gambhir et al[9] with 32% prevalence. Luo et al[10] reported that the prevalence of poor sleep quality in elderly population was 41.5%. This difference in prevalence of insomnia could be attributed to variety of diagnostic tools used for insomnia and criteria along with varying geographical distribution, and seasonal changes, and different study settings.

In present study after adjusting for factors like age, marital status, general problems, ENT, Eye and endocrine morbidities, those with higher age, with endocrine system morbidities and general problems were found to have higher odds of having insomnia. With increase in age there is decrease Peripheral blood mononuclear cells (PBMC) telomere length which is responsible decrease in quality and quantity of sleep causing insomnia.[11] Similarly regarding morbidities same findings were reported by studies.[9,10,12] The general pain like problems causes sleep disturbances in night[13].

In insomnia there is decrease in the immune function. It is found that people with insomnia has lower levels of CD8+ cells[14], and IFN-Y[15] than normal individuals. There is reduction in natural killer cell activity, interlukin-2 production and lymphocyte production[16].Such alteration makes them vulnerable to have medical problems. Also medical disorders may result in sleep disturbances, sleep disturbances themselves may contribute to insomnia.

Conclusion

The prevalence of insomnia among elderly was 24.4%, associated with increasing age, general health problems and endocrine problems.

Limitation

The temporal association between insomnia and medical disorder is beyond the investigation in our study. Prospective longitudinal studies with larger sample size are needed for further conclusions.

Recommendations

Multidimensional strategies are needed to educate geriatric population about their health problems. Focusing on –recognition of important risk factors, early diagnosis, treatment and follow up by trained health personnel. Spouse and other family members can play a key role in preventing insomnia

Acknowledgment

The authors are appreciative to all the participants for their support and contribution.

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