



Impact of Insomnia on Anxiety and Depression among Post Stroke Patients

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ABSTRACT

Introduction: Insomnia is prevalent but unappreciated condition follows a stroke that can hamper recovery. The impact of insomnia on post stroke patient's anxiety and depression remains unclear.

Aim/Objectives: The study aimed to evaluate the association between the Insomnia with Anxiety and Depression among post stroke patients.

Methodology: A cross sectional, observational, study was conducted among post stroke patients, aged above 30years. Of 200 responses, 191 responses who were willing to participate in the study were included. The survey instrument used were Hospital Anxiety Depression Scale (HADS) and Insomnia Severity Index (ISI) to access the anxiety, depression and quality of sleep among post stroke patients.

Results: Majority of the study participants were males (59.2 %). In the present study, 34% of the participants were under the age group of 50 – 60. Based on Insomnia Severity Index majority of the responders had moderate insomnia (57%). Majority of study population had abnormal (71.20%) level of Anxiety and borderline (41.36%) depression level. There was significant association of severity of ISI with severity of Anxiety (p=0.030) and depression (p=0.049) among post stroke patients.

Conclusion: Stroke leads to significant reduction in quality of life. Reduction in daily activity results in worsening of function and disturbance in sleep, leads to depression that affects the physical and mental health. Post stroke patients with the symptoms of insomnia are at the risk of developing anxiety and depression.

Key Words: Anxiety, Depression, Insomnia, ISI, Stroke, Quality of Life, Stroke Patients

INTRODUCTION

Globally, stroke is the second leading cause of death and disability. According to WHO 2019 global health estimate, about 11% total mortality is due to stroke. Stroke increases the global burden of disease, which impart the pressure on the affected individuals and their family & society.¹ Recurrence rates, estimated at 17% over five years, were extremely high. Since the advent of lytic drugs and endovascular devices, stroke patients have been provided more effective care than ever before.² Post stroke, patients commonly undergone emotional problems, difficulties in daily activities and physical disabilities.^{2,3,4} It also increases other risks for secondary diseases such as dementia, fracture, myocardial infarction, cardiac arrhythmias, and cardiac arrest,^{5,6,7} but especially mental health problems, such as depression, anxiety, and insomnia.⁸⁻¹⁰

Insomnia is defined as difficulty in initiating the sleep/ maintaining the sleep or awaking in early mornings.¹¹ Post stroke insomnia is a prevalent condition among stroke patients. According to a recent meta-analysis, PSI is widespread; when stroke patients are simply considered the prevalence rises to 40.7% when using the diagnostic tests for insomnia.¹⁰ There exists a two-way relationship between stroke and sleep.¹² In individuals with stroke, insomnia is associated with a greater mortality and noticeably worsen quality of life (QoL)^{13,14} and lack of sleep affects stroke outcomes and increases stroke the risk.^{15,16} Earlier studies highlighted that stroke survivors with chronic insomnia had higher rates of depression, anxiety, and disability than survivors without chronic insomnia, and increased symptoms of insomnia were linked with comorbid depression and anxiety.^{17,10} Ischemic stroke alters the sleep pattern and the endogenous circadian rhythm, indicates the bidirectional relationship between stroke and sleep.

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rectional relationship between stroke and sleep.¹⁸ Earlier studies also emphasized that the insomnia as a risk factor for anxiety and depression among post stroke patients.¹⁷⁻¹⁹ A recent study also showed the impact of sleep quality on post stroke anxiety (PSA) in stroke patients. The finding showed that poor sleep quality before stroke was associated with PSA and may be an independent risk factor of PSA one month after acute ischemic stroke (AIS) onset.²⁰ Thus, the current study aimed to evaluate the association between the Insomnia with Anxiety and Depression among post stroke patients.

MATERIALS AND METHODS

A cross sectional, observational, study was conducted among post stroke patients, aged above 30 years, between October 2022 to January 2023. Of 200 responses, 191 responses who were willing to participate in the study were included in the study, who were aged above 30 years, were included in the study. Those who were hospitalized and not willing to participate in the study were excluded. The survey instrument used were Hospital Anxiety Depression Scale (HADS) and Insomnia Severity Index (ISI) to access the anxiety, depression the quality of sleep among post stroke patients. The survey was carried out by using Self-administrated Questionnaires using Google forms and were shared through various social media platforms and the data collected were analysed. The study was approved (AMH-DNB-066/10-22) by the Institutional Ethics Committee, Apollo research and Innovations, Chennai.

The questionnaire consists of the following sections: the first section includes demographic details, which included age, gender, marital status, educational qualification and occupation. The second section includes the Insomnia severity index questions. It a 5-item questionnaire. ISI categories are no clinically significant insomnia (score 0–7), subthreshold insomnia (score 8–14), moderate clinical insomnia (score 15–21), and severe clinical insomnia (score 22–28). The last section includes Hospital anxiety and Depression questionnaire, which is also a self-administered questionnaire, based on two subscales, anxiety and Depression. Each subsection consists of 7 questions each using Liked scale. A total score of 0–7 indicates “normal,” 8–10 indicates “borderline abnormal” and score of 11 – 21 is “abnormal. The baseline characteristics of the participants were presented as frequency and percentages. For comparison between groups, t-test was used for continuous variables and Chi-square tests were used for categorical variables or one-way analysis of variance (ANOVA). A p value of less than 0.05 was considered to be statistically significant. SPSS software version 20 (IBM corp.) was used to assess the data.

RESULTS

Of the total 200 respondents (post stroke patients) enrolled in the study and started filling the questionnaires, 95.5% (191 out of 200 individuals) completed the whole survey, and were considered for the statistical analyses. Majority of the study participants were males (59.2 %). In the present study, 34% of the participants was under the age group of 50 - 60, all the participants are educated with 61.78% completed their graduation, followed by 21.98% completed their post-graduation and 16.23% completed their high schooling (Table 1).

Based on Insomnia Severity Index majority of the responders had moderate insomnia (57%), followed by mild insomnia (34.5%) and severe insomnia (2.61%). Similar pattern was observed in males, whereas among female's majority were mild insomnia (43.93%), followed by moderate (40.36%) and severe insomnia (20%) (Table 2). Among 30- 40 yrs age group, majority were normal (36.63%), followed by severe (40%) and mild insomnia (33.33%), among 40 – 50 yrs. Age group majority were moderate insomnia (27.52%) followed by mild insomnia (16.66%). Among 50 – 60 age group majority were moderate (37.61%) and mild (31.81%) respectively. Similar pattern was observed in 60-70 years age group also (Table 3).

Table 4 depicts the anxiety and depression among the study population. Majority of study population had abnormal (71.20%) level of anxiety and borderline (41.36%) depression level. Based on gender majority of the males had abnormal levels (6.23%) for anxiety, whereas majority of females has borderline anxiety (52.38%) level. Similar pattern was observed in depression, majority of the male had abnormal (63.63%) level of anxiety, whereas females had borderline depression (41.77%) level.

Abnormal level of anxiety was observed majorly among 40–50 (24.26%) age group and 50 – 60 (36.76%). Whereas borderline anxiety level was observed in 30–40 (28.57%) age group and 60-70 (23.80%). Abnormal level of depression was observed majorly among 50- 60 (42.85%) age group, whereas borderline depression level was observed in 30- 40 (26.58%) age group and 40–50 (26.58%) (Table 5). There is significant association of severity of ISI with severity of anxiety ($p=0.030$) and depression ($p=0.049$) among post stroke patients (Table 6). Pearson correlation test showed that there is significant positive correlation exist between ISI, anxiety and depression (Table 7). There exists moderate correlation between ISI and anxiety ($r=0.094$; $p=0.001$), which is followed by ISI and Depression ($r=0.114$; $p=0.01$) and anxiety and ISI ($r=0.114$; $p=0.001$).

DISCUSSION

The current study focused on the relationship between insomnia after stroke and emotional outcomes (Anxiety and

Depression). Many earlier researches were cross-sectional and focused on functional rehabilitation prognosis, which cannot reveal causal link while ignoring psychological prognosis. The current study evaluated the association of Insomnia with anxiety and depression among post stroke patients. The study population had moderate insomnia, abnormal level of anxiety and borderline depression level. As age progresses the severity of insomnia also increases. Prevalence of insomnia is relatively less and it is relatively high as age progresses.²¹⁻²³ Age above 40 years had abnormal level of Anxiety, whereas abnormal depression level was noticed among individuals aged above 50 years. The findings demonstrated that there is significant association of insomnia with anxiety and depression among post stroke patients. Further, there is a moderate correlation between ISI, anxiety and depression.

Mood, stroke, and sleep all interact with each other. Current study showed that post stroke, patients were more likely to suffer from insomnia, anxiety and depression. Post stroke patients are more likely to develop anxiety, depression and insomnia.^{10, 24,25} Insomnia, anxiety and depression thought to be risk factors for stroke, perhaps they also predict the recurrence.²⁶⁻²⁸ Also, it has been demonstrated that insomnia increases the likelihood of post-stroke anxiety and depression.¹⁹

Although depression is more prevalent in women in general²⁹ the association between the severity of insomnia and the risk of depression may differ between men and women. Morita et al., highlighted that women with delayed sleep-wake time and men with trouble falling asleep and daytime sleepiness are more likely to suffer from depression.³⁰

Researchers have also discovered evidence that persistent sleep deprivation can have an impact on your emotional well-being. Studies highlighted that individuals with sleep disturbances, which causes to wake up frequently during the night, are more likely to suffer from mental health issues such as anxiety, panic disorder, and depression. Insomnia following a stroke has been linked to depression severity³¹, and there are cross-sectional relationships between insomnia, anxiety, psychotropic drug usage, and depression.³² This is not surprising considering that many psychotropic medications are used for insomnia and that sleep disorders like insomnia are common causes of anxiety and depression.

CONCLUSION

Insomnia is widespread in stroke survivors, and it is associated considerably with higher risk of poststroke anxiety and depression. The findings of this study point to the importance of insomnia screening after stroke and suggest that early detection and treatment of insomnia may assist improve emotional outcomes among stroke patients. This study provides information's to clinicians, patients and their families

on prevalence of insomnia, anxiety and depression in stroke survivors. There was paucity of data that identifies, screened for, or intervened for poststroke insomnia, despite the fact that there are multiple evidence-based techniques to treating and screening for persistent insomnia.³³ Many of these, such as sleep hygiene, require little therapeutic involvement, and there are newer internet-based modalities³⁴ with demonstrated efficacy and may not pose the same risk in a morbid population as some medication therapies. Such an approach is worth investigating to see if these observational findings can be translated into insomnia-focused, adjunctive interventions that improve poststroke outcomes and the associated personal and societal economic costs associated with unemployment and health-care utilization. Stroke leads to significant reduction in quality of life. Reduction in daily activity results in worsening of function and disturbance in sleep, leads to depression that affects the physical and mental health. Screening for and treating post-stroke insomnia should become part of the therapeutic plan to improve the results of this potentially fatal condition.

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Authors' Contribution:

Kavipriya M and Hiranyamayi Kulkarni involved in the literature search, conduct of the study, data collection and analysis, and draft manuscript preparation. Hilda Solomon involved in study concept and manuscript preparation. Jayanthi Swaminathan and Anitha Rani involve in study concept, manuscript reviewing, editing and final approval of the manuscript.

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ASSESSING THE QUALITY OF LIFE AND ITS IMPACT IN POST STROKE PATIENTS.

Table 1: General Demographic characteristic

S. No.	Characteristic	N (%)
	Age	
	30 – 40	41 (21.5%)
	40 – 50	45 (23.6%)
	50 – 60	65 (34%)
	60 - 70	40 (20.9%)
	Gender	
	Male	113 (59.2%)
	Female	78 (40.8%)
	Education	
	Schooling	31 (16.23%)
	Graduate	118 (61.78%)
	Post graduate	42 (21.98%)

Table 2: Insomnia Severity Index

S. No.	Insomnia Severity Index	Over all N (%)	Male N (%)	Female N (%)
1	Normal	11(5.75%)	7(63.63%)	4(36.36%)
2	Mild insomnia	66(34.5%)	37(46.96%)	29(43.93%)
3	Moderate Insomnia	109(57%)	65(59.63%)	44(40.36%)
4	Severe insomnia	5(2.61%)	4(80%)	1(20%)

Table 3: Insomnia severity among Age groups:

S. No.	Insomnia Severity Index	30 – 40 yrs. N (%)	40 – 50 yrs. N (%)	50 – 60 yrs. N (%)	60 – 70 yrs. N (%)
1	Normal	4(36.36%)	3(27.27%)	1(9.09%)	3(27.27%)
2	Mild insomnia	22(33.33%)	11(16.66%)	21(31.81%)	12(18.18%)
3	Moderate Insomnia	13(11.92%)	30(27.52%)	41(37.61%)	25(22.93%)
4	Severe insomnia	2(40%)	1(20%)	2(40%)	0(0%)

Table 4: Anxiety and depression among the study population:

S. No.	Severity		Normal	Borderline	Abnormal
1	Anxiety	Over all N (%)	13(6.80%)	42(21.98%)	136(71.20%)
		Male N (%)	7(53.84%)	20(47.61%)	86(63.23%)
		Female N (%)	6(46.15%)	22(52.38%)	50(36.76%)
2	Depression	Over all N (%)	35(18.32%)	79(41.36%)	77(40.31%)
		Male N (%)	18(51.42%)	46(58.22%)	49(63.63%)
		Female N (%)	17(48.57%)	33(41.77%)	28(36.36%)

Table 5: Severity of Anxiety and Depression among Age groups.

S. No.	Severity		Normal	Borderline	Abnormal
1	Anxiety	30 – 40 yrs.	3(23.07%)	12(28.57%)	26(19.11%)
		N (%)	40 – 50 yrs.	5(38.46%)	7(16.66%)
			50 – 60 yrs	13(30.95%)	50(36.76%)
			60 – 70 yrs	3(23.07%)	10(23.80%)
2	Depression	30 – 40 yrs.	10(28.57%)	21(26.58%)	10(12.98%)
		40 – 50 yrs.	6(17.14%)	21(26.58%)	18(23.37%)
		50 – 60 yrs	11(31.42)	21(26.58%)	33(42.85%)
		60 – 75 yrs	8(22.85)	16(20.25%)	16(20.77%)

Table 6: Association of ISI between anxiety and Depression.

ISI	Anxiety			p - value
	Abnormal	Borderline	Normal	
Normal (n=11)	6	1	4	0.030*
Mild insomnia (n=66)	44	19	3	
Moderate Insomnia (n=109)	83	21	5	
Severe insomnia (n=5)	3	1	1	
		Depression		0.049*
Normal (n=11)	1	6	4	
Mild insomnia (n=66)	22	31	13	
Moderate Insomnia (n=109)	52	39	18	
Severe insomnia (n=5)	2	3	0	

*Significant (p < 0.05)

Table 7: Correlation between ISI, Anxiety and depression.

S. No.	Variable	R	p - Value
1	ISI -Anxiety	0.114	0.001
2	ISI - Depression	0.094	0.001
3	Anxiety - ISI	0.114	0.001

R = Pearson Correlation Coefficient; P value < 0.05