



PREVALENCE OF INSOMNIA AMONG HYPERTENSIVE PATIENTS AND ITS ASSOCIATION WITH ANTIHYPERTENSIVE DRUGS

Physiology

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ABSTRACT

Hypertension is a chronic disease quite common in the day to day scenario and is ranked as the first most important risk factor driving the most death and disability combined in Kerala (2016) (3). Hypertension and insomnia are found to coexist (1) (2). The prevalence of insomnia among hypertensive patients of South Kerala has not been properly studied, this study aims to investigate the same. This study in addition to this tries to find out the association between insomnia and antihypertensive drugs, as previous researches have suggested insomnia as a possible side effect of antihypertensive medication (5). So proper diagnostic measures should be adapted, with special surveillance of insomnia prone members of society (based on epidemiological evidences) so as to prevent and treat insomnia at early stage itself and also prevent its progression to hypertension.

KEYWORDS

INTRODUCTION

Hypertension is a chronic disease quite common in the day to day scenario. According to the latest European guidelines (2018) hypertension is defined as blood pressure (BP) $>140/90$ mm Hg (6) whereas according to the latest American guidelines (2017) hypertension is defined as BP $<130/80$ mm Hg (7). It is ranked as the first most important risk factor driving the most death and disability combined in Kerala (2016) (3). The prevalence of hypertension in India is 29.8% (about 33.8% in urban and 27.6% in rural population) (8).

Hypertension and insomnia are found to coexist (1) (2). According to ICSD 3, insomnia is a condition characterized by 'a persistent difficulty with sleep initiation, duration, consolidation, or quality that occurs despite adequate opportunity and circumstances for sleep, and results in some form of daytime impairment' (9). Panda et al. reported a prevalence of 18.6% insomnia in the South Indian population (9).

As per an Indian study the prevalence of insomnia is 47.2% among the hypertensive population (1). The prevalence of insomnia among hypertensive patients of South Kerala has not been properly studied, thus this study aims to investigate the same. This study in addition to this tries to find out the association between insomnia and hypertension on antihypertensive drugs, as previous researches have suggested insomnia as a possible side effect of antihypertensive medication (5). The study also wishes to investigate on the association of insomnia with drug history. This could help to find out if therapy is a significantly associated factor determining insomnia, especially among hypertensive population or is a factor deciding the advancement of insomnia to hypertension. The study design chosen is cross-sectional observational study. The study adopts an interview based approach on a local community of South Kerala.

AIMS AND OBJECTIVES

The objectives of the study are:

- To determine the prevalence of insomnia among hypertensive patients in a community of South Kerala
- To determine the association of insomnia with antihypertensive drugs, and the type of antihypertensive drugs used.

MATERIALS AND METHODS

The materials used for data collection were questionnaire for interview, consent form and information sheet provided separately to each participant. For data analysis and reference, Microsoft Office 2013, internet and books were used. Institutional Ethics Committee clearance was obtained. Hypertensive patients on anti-hypertensive drugs and willing to participate in the study was taken as a study population.

Exclusion Criteria

Patients with any psychiatric disorder, chronic pain, severe asthma or

COPD, any acute febrile illness, pregnant women, were excluded from the study.

Inclusion Criteria

Hypertensive patients on drugs who are willing to consent for the study, were recruited for the study until the sample size is met.

Data Collection Tool

Insomnia scales - Athens insomnia scale (AIS) [attached with the Questionnaire]

A cut-off score of ≥ 6 on the AIS is used to establish the diagnosis of insomnia. Data was entered in MS Office Excel 2013. Prevalence was expressed as % and association was assessed using Chi square test. P value less than 0.05 is taken as statistically significant.

OBSERVATIONS AND RESULTS

1) Anti-hypertensive drug intake details (Fig.1)

Out of 120 (100%) participants 67 (55.8%) are under Calcium channel blockers, 43 (35.8%) are under Angiotensin Receptor Antagonists, 20 (16.6%) under Beta adrenergic receptor antagonist, 8 (6.7%) under Diuretics, 6 (5%) under Angiotensin Converting Enzyme inhibitors, 3 (2.5%) under alpha - adrenergic receptor antagonists and 1 (0.8%) under alpha 2 adrenergic receptor agonist.

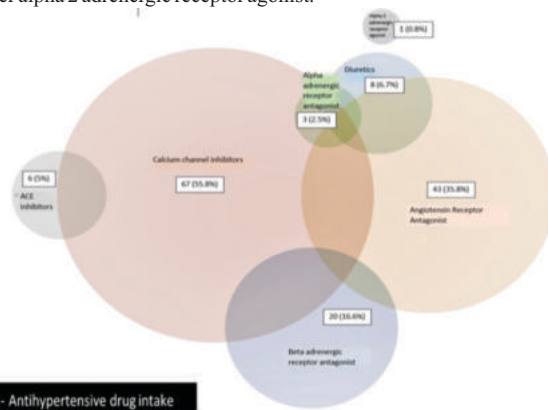
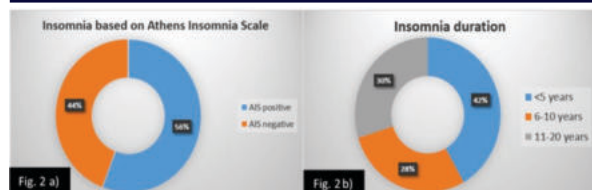


Fig. 1- Antihypertensive drug intake

II) Insomnia History:

Insomnia assessed using Athens Insomnia Scale (Annexure I), indicated out of 120 (100%) participants, 67 (55.8%) have insomnia (AIS positive) while 53 (44.2%) do not have insomnia (AIS negative). Out of 67 (100%) participants having insomnia (AIS positive) the duration of insomnia is approximately less than 5 years for 28 (41.7%) participants, between 6 and 10 years for 19 (28.3%) and between 11 and 20 years for 20 (29.8%) participants. Fig.2 a and 2 b.



III) Association Of Insomnia With Antihypertensive Medications (Table 1)

Out of 67 (100%) with insomnia (AIS positive), 6 (9%) were medicated with diuretics ($p=0.446$); 36 (53.7%) with Calcium channel blockers ($p=0.737$); 1 (1.5%) with Angiotensin converting enzyme inhibitors ($p=0.119$), 25 with Angiotensin Receptor Antagonists ($p=0.850$); 10 (14.9%) with Beta adrenergic receptor antagonists ($p=0.742$); 1 (1.5%) with Alpha adrenergic receptor antagonists ($p=0.837$); and 0 (0.0%) with alpha-2-adrenergic receptor agonists ($p=0.906$).

Table 1. Association of Insomnia with antihypertensive medications (drugs)

Antihypertensive medication	Total no. of people under medication	No. of people with AIS positive	No. of people with AIS negative	p value
Diuretics	8 (6.7%)	6 (9%)	2 (3.8%)	0.446
Calcium channel blockers	67 (55.8%)	36 (53.7%)	31 (58.5%)	0.737
ACE inhibitors	6 (5%)	1 (1.5%)	5 (9.4%)	0.119
Angiotensin II receptor antagonists	43 (35.8%)	25 (37.3%)	18 (34%)	0.85
Beta adrenergic blockers	20 (16.7%)	10 (14.9%)	10 (18.9%)	0.742
Alpha adrenergic blockers	3 (2.5%)	1 (1.5%)	2 (3.8%)	0.837
Alpha-2 adrenergic receptor agonists	1 (0.8%)	0 (0.0%)	1 (1.9%)	0.906

DISCUSSION

Hypertension and insomnia are closely interlinked. In this study the prevalence of insomnia among hypertensive patients was found to be 55.8% in the South Kerala population. This is slightly more compared to the general Indian population. A Chinese study recorded the prevalence of hypertension in those with no insomnia, occasional insomnia and frequent insomnia as 37.3%, 43.0% and 48.0% (2). According to Palagini L *et al.*, mechanism underlying this might be related to hyperarousal due to an overactivation of stress system functions (10). Based on this, prolonged sleep loss act as a stressor that impair brain functions. This chronic stressor could precipitate systemic inflammation and activate the sympathetic nervous system (11) resulting in increased blood pressure (12). In the study of the 6 (100%) who consulted 4 (67%) are currently on medication for insomnia while 2 (33%) are not on medication. Medications for treatment of insomnia include benzodiazepine receptor agonists, melatonin receptor agonists, selective histamine receptor antagonists, and dual orexin/hypocretin receptor antagonists (Neubauer DN *et al.*) (13). Silveira J *et al.* found out that those who use sleeping medication had poorer quality of sleep compared to hypertensive patients who did not use medication (14). This implies that for insomnia among hypertensive patients symptomatic treatment does more harm than good.

In this study though drugs like Angiotensin II receptor antagonists and Calcium channel blockers have high prevalence (53.7% and 37.3% respectively among patients with insomnia), no statistically significant association could be established between insomnia and antihypertensive medications (Table 1). However Karthik R *et al.* had found significant association between insomnia and Angiotensin II receptor antagonists ($p=0.000$) and Calcium channel blockers ($p=0.003$). This could be attributed to the larger sample size used in the study [$N=657$] (1). A study by Prejbisz A *et al.* found out significant association between the number of antihypertensive drugs and frequency of insomnia (15).

CONCLUSION

From the study it is clear that insomnia is often not medically diagnosed or treated, but has a significant prevalence (of 55.8%) in the population; especially among the hypertensive population. So proper diagnostic measures should be adapted, with special surveillance of

insomnia prone members of society (based on epidemiological evidences) so as to prevent and treat insomnia at early stage itself and also prevent its progression to hypertension.

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