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CORONARY ARTERY DISEASES;
FREQUENCY AMONG PATIENTS WITH DIFFERENT SLEEP DURATION

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ABSTRACT… Introduction: Ischemic heart disease (IHD) is one of the leading causes of death. Short sleep duration may increase the risk of coronary artery disease (CAD). The study was designed to evaluate the association between CAD and sleep duration. **Objectives:** To determine the frequency of patients who have short sleep duration may suffer from CAD. **Study design:** Case series. **Setting:** Punjab Institute of Cardiology (PIC), Lahore. **Period:** It was carried out in six months. **Methods:** 400 patients admitted who presented with IHD. Sleep duration was categorized into three categories like <6 hours, 6-8 hours and >8 hours. Angiography was performed for patients who have CAD. **Results:** Sleep duration was <6 hours, 6–8 hours, and >8 hours in 172 (43%), 124 (31%) and 104 (26%) patients respectively. Significant CAD was presented among 84 (21%) patients of sleep duration <6 hours, 16 (4%) patients of sleep duration 6–8 hours and 32 (8%) patients of >8 hours sleep duration. **Conclusions:** Significant number of patients has short sleep time and suffering from CAD.

Key words: Sleep duration; Ischemic heart disease (IHD); Coronary artery disease (CAD); Angiography.

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INTRODUCTION

Ischemic heart disease (IHD) is tenth leading cause of death worldwide.[1] Seventeen hundred thousand or more people die in every year with cardiovascular disease and principal causes are IHD and stroke.[2] 6% prevalence of Age-adjusted coronary heart disease (CHD) was reported in the United States in 2010.[3] One in four people aged over 40 years may have coronary heart disease.[4]

Coronary artery disease (CAD) is a grave illness correctly in light of the fact that a healthy subject in the prime of life may die or get disability without any preceding illness. When the affected individual is less than 40 years old, sad outcomes for family and friends are especially devastating and unexpected. Myocardial infarction (MI) and CAD incidence in adults is low; Many studies showed that about 3% CAD cases occur in <40 year of age.[5] CAD management has always been a challenge for physicians, valid therapy is a need of day for early diagnosis.[6]

South-Asian people are at utmost risk for CAD in the world and currently turned into the leading cause of death in the Indo-Pak. Prevalence of CAD uplifted 2.5 fold in two decades. 3.6% was in 1970s and 9.5% in 1990s in age group ≥35 years in urban India.[3]

Chronic sleep deprivation/loss or changes in sleep duration are common in modern society.[7] 33% adults have sleep time <6 hours every night.[8] Natural light, long working time, economic benefits in shift and night works, watching TV and listening radio, internet surfing has decreased the sleep duration.[9]

Short sleep deprivation in healthy persons has an outcome of adverse physiologic changes,

decreased glucose tolerance and increased insulin resistance, sympathetic tone and blood pressure.[10,11] Short sleep duration may raise the levels of C-reactive protein that related to cardiovascular disease (CVD) independently.[12]

Prolonged sleep duration is related with devastating health outcomes including absolute mortality, type II diabetes, hypertension and obesity.[13,14,15,16] Short sleep duration has toxic effects on a variety of systems with detectable changes in metabolic, endocrine and immune pathways.[17,18] Endocrinological changes upturn appetite, caloric intake, reduce energy expenditure, facilitate obesity and impaired glycemic control with increased CVD risk. Sleeping <6 hours have a greater risk for development of CAD than sleeping 7-8 hours daily.[18] Low socio-economic status, level of physical activity, unemployment and undiagnosed health conditions are related with long sleep duration and confound with CHD morbidity and mortality.[19,20]

29.2%, 17.43% and 18.5% prevalence of CVD were found in Americans and Indians who slept <5 hours, 6-8 hours and >9 hours respectively.[21] 6.9%, 5.8% and 10.1% CAD prevalence was found in people who slept <6 hours, 6-8 hours and > 8 hours respectively.[22] Significance of study is that it first time conducted in Pakistan.

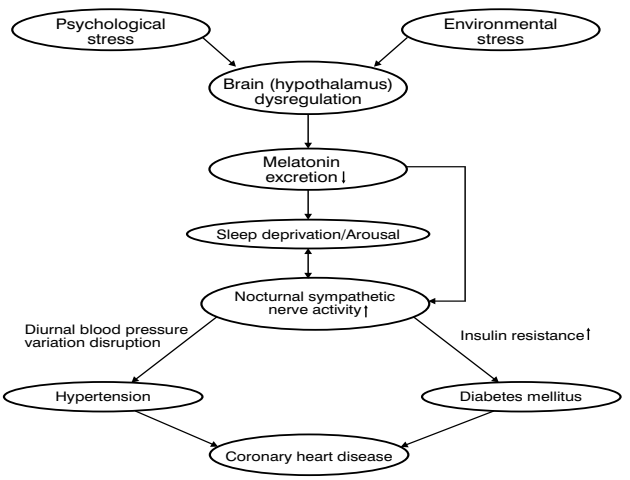

Figure-1. Relationships between sleep deprivation and hypertension, diabetes mellitus, and coronary heart disease.

OBJECTIVES

To determine the frequency of patients who have short sleeping duration may suffer from CAD.

MATERIAL AND METHODS

400 patients were enrolled in six month by taking consent and consecutive sampling technique was used. Case series design was applied and setting was outpatient department and emergency department of Punjab Institute of Cardiology (PIC). Inclusion criteria of patients in the study were evidence of IHD whereas patients having smoking habit, cancer, chronic back pain, BMI>30 or taking anxiolytic or hypnotic drugs were excluded. Sleep duration was categorized into three categories i.e. <6 hours, 6-8 hours and >8 hours. The patients of all three groups were assessed by coronary angiography for the presence or absence of significant CAD.

Statistical Analysis

Data was entered and analyzed using SPSS 20.0. Frequencies (percentages) were calculated for categorical variables like gender, patients with IHD according to duration of sleep and significant CAD. Mean and standard deviation (SD) were calculated for quantitative variables like age.

RESULTS

400 patients were registered in the study. Mean±SD of age of the patients was 56.99+9.06 years [age range 25-78 years]. There were 4 (1%) patients of age range of <30 years, 12 (3%) patients of 31-40 years, 118 (29.5 %) patients of 41 - 50 years, 189 (47.25%) patients of 51-60 years, 45(11.25%) patients of 61–70 year and 32 (8%) patients of 71–80 years of age. (Table-I) 252 (63%) male patients and 148 (37%) female patients participated and. male to female ratio was 1:7. (Figure-2)

172 (43%) patients have sleep duration <6 hours, 124 (31%) patients have sleep duration 6–8 hours and 104 (26%) patients have sleep duration > 8 hours. (Table-II)

Significant CAD was seen among 132 (33%) patients while 268 (67%) patients have insignificant CAD. (Figure-3)

Significant CAD was present among 84 (21%)

patients whose sleep duration is <6 hours. Only 16 (4%) patients have CAD whose sleep duration is 6-8 hours. CAD was present among 32 (8%) patients whose sleep duration is >8 hours. (Table-III)

Age (Years)	No.	Percentage
< 30	04	01
31-40	12	03
41-50	118	29.5
51-60	189	47.25
61-70	45	11.25
71-80	32	08
Mean ± SD	56.99 + 9.06	
Range	25 – 78	

Table-I. Age wise distribution

Sleep duration	No. of patients	Percentage
< 6 hours	172	43
6–8 hours	124	31
> 8 hours	104	26

Table-II. Pattern of sleep duration

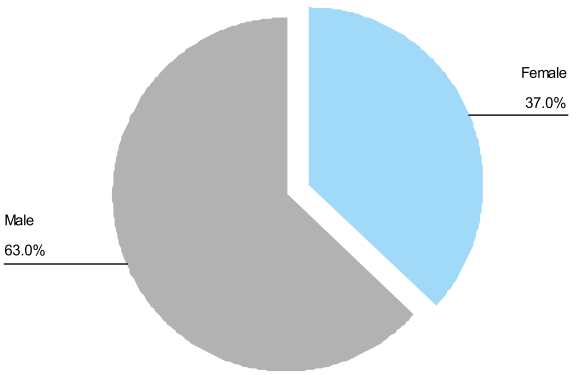

Figure-2. Gender wise distribution

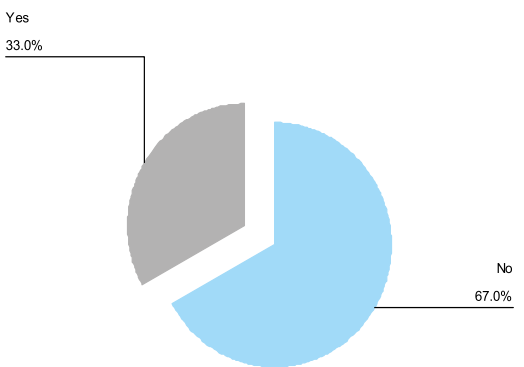

Figure-3. Distribution of patients by presence of significant CAD

Sleep duration	Coronary Artery Disease	
	Yes	No
<6 hours	84 (21%)	88 (22%)
6–8 hours	16 (4%)	108 (27%)
>8 hours	32 (8%)	72 (18%)
Total	132 (33%)	268 (67%)

Table-III. Sleeping duration with presence of significant CAD

DISCUSSION

Sleep duration has been viewed as a cause that influences the health of body. This study was carried out to determine whether sleep duration may affect the status of CAD. 400 patients having ischemic conditions of the heart were enrolled within 6 month. This study was determined that sleep duration <6 hours may be related with ischemic heart disease (21%). This study is representative of an Asian community living urban life style.

Sleeping duration of <6 hours was related with significant CAD In this study whereas Sabanayagam C. et al, remarked that 29.2% patients were suffering from CVD having <5 hours sleep duration.[22] A meta-analysis consisting 15 prospective studies showed a positive association between short and long sleep duration with CVD. Short duration of sleep was significantly associated with a greater risk of developing of CHD (RR 1.48, 95% CI 1.22–1.80, P < 0.0001).[18] But no association of long sleep duration was found with CAD in this study.

43% patients had a sleep duration of <6 hours in our study whereas Bonnet MH, et al showed that 37% persons have 8 hour sleep duration per night and 31% have ≤6 hour.

Long/short sleep duration show secular trends in modern society which requiring longer work hours, shift-works but 24hours/7days availability of commodities is reducing the average sleep duration in western populations with increased reporting of fatigue, tiredness and excessive daytime sleepiness.[24]

CONCLUSION

Majority of the patients had short sleep duration

(<6 hours). There was found an increased frequency of patients who have short sleep duration. It is recommended that cardiac risk evaluation should be done in every patients who has a short sleep duration (<6 hours/ 24 hours).

Author's Contribution

QHMHA and BB planed and designed the study, collect the data, wrote the initial and final draft. KR reviewed study design and final manuscript. AUK and AA searched the literature and wrote the introduction and discussion. KMA wrote the methodology, coded the data, entered the data in SPSS, analyzed the data and interpret the results, formatted and reviewed the paper and removed the similarity of index.

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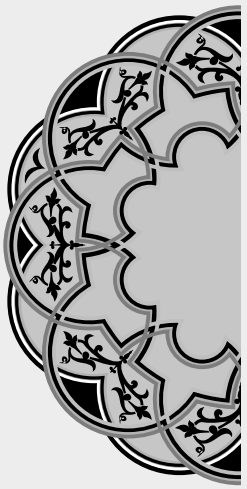

"Nothing Is impossible."

Unknown

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Qari Hafiz M. Habib Afzal	Planed and designed the study, collect the data, Wrote the initial and final draft.	
2	Kamran Ruaf	Reviewed study design and final manuscript.	
3	Areej Umber Khan	Searched the literature and wrote the introduction and discussion.	
4	Asma Ashfaq	Searched the literature and wrote the introduction and discussion.	
5	Muhammad Bilal Basit	Planed and designed the study, collect the data, wrote the initial and final draft.	
6	Khalid Mahmood Anjum	Wrote the methodology, coded the data, entered the data is SPSS, analyzed the data and interpret the results, formatted and reviewed the paper and removed the similarity of index.	