

A STUDY ON THE SEVERITY OF SLEEP DISORDERED BREATHING IN CARDIAC PATIENTS WITH DIABETES MELLITUS

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Abstract

This is a Randomized study of patients with diabetes mellitus conducted in the Department of Cardiology in a private tertiary care hospital. The study was conducted for a period of three years from January 2018 to December 2020. A total of 250 cases with various cardiac disorders were analyzed and the association between SDB and cardiac diseases were studied and found out various management techniques. Written consents were taken from all the participants. Patients with uncontrolled diabetes mellitus with complain of sleep-disordered breathing were included in the study. The severity of SDB was measured with the help of three questionnaires: Epworth Sleepiness Scale, Stop-Bang questionnaire and Berlin questionnaire, All the patients were evaluated. Diabetes Mellitus was diagnosed. Demographic data including age, sex, Body Mass Index (BMI), medication for diabetes were collected in structured Proforma after informed consent. Our study Shown more severe SDB symptoms In Cardiac Patients With Diabetes Mellitus

Key words: Sleep Disordered Breathing, Epworth Sleepiness Scale, Stop-Bang questionnaire, Berlin questionnaire.

INTRODUCTION

Poor sleep is one of the most frequently reported symptoms among patients with cardiac disorders and which is experienced by many patients like, 75%. Factors which contribute to poor sleep in this people are multidimensional and may include demographic characteristics, (gender, aging) the pathophysiology of cardiac disorders, co-morbid health problems (pain, depression) symptoms of cardiac disorders, medication and primary sleep disorders. Sleep disordered breathing (SDB) is a diverse group of disorders which are characterized by abnormal respiration during sleep. In patients with cardiac disorders, two types of sleep apnea can be seen, obstructive sleep apnea and central sleep apnea (OSA and CSA). SDB also complicates diseases of the neuromuscular system, chest wall, heart and lungs. OSA occurs as a result of upper airway collapse, whereas CSA occurs as a result of reductions in central respiratory drive.

In this study, 40.8% patients were having diabetes mellitus. This shows a strong association of diabetes with SDB and cardiac disorders. In a similar study conducted by Kamran Mahmood et al, it was

examined that the prevalence of type 2 DM was 30.1% in the group with OSA compared in those without OSA. Also SDB is independently associated with glucose intolerance and insulin resistance and may also contribute to the pathogenesis of type 2 diabetes.

Examination of other co morbidities showed that 9.2% were having BA/COPD disease, 9.2% patients with CVA and 5.6% patients with hypothyroidism. A study conducted by Mihaela Teodorescu *et al* found that asthma was associated with an increased risk of new onset OSA.

Examination of the risk factors revealed that 31.2% patients were having chest pain as the major complaint followed by 29.6% patients with complaint of dyspnea. A study conducted by Hagman M *et al* shows that dyspnea was reported in 21% of the total population and in 70% of the angina population. Dyspnea may form a differential diagnostic symptom to chest pain in ischemic heart disease. Dyspnea was reported in 36% cases who developed angina pectoris and in 35% patients who developed angina pectoris associated with MI.

Analysis of BMI showed that 50.8% patients with normal weight (BMI: 18.5-24.9), 25.8% patients were overweight, 8.4% were obese and 8.8% patients were underweight. In a study conducted by Kohler MJ *et al* reported that there is an increased risk for OSAS in association with overweight and obesity in adults.

METHODOLOGY

STUDY SITE:

The study was conducted at a private tertiary care hospital at Coimbatore. It is an 894 bedded multi-disciplinary super speciality hospital, one of the largest hospitals in Coimbatore.

DEPARTMENT SELECTED FOR STUDY:

The department selected for the reserach work was Cardiology Department and the reason for selection of this department was that this study revealed more prevalence of SDB cases in the cardiology department

PATIENT SELECTION

Inclusion criteria: Patients with cardiac disorders, admitted in department of Cardiology who are willing to participate in the study.

Exclusion criteria

Patients who are admitted for more than one week after stroke onset, with coma and those who are not willing to participate in the study and patients with insufficient data in their records.

SAMPLE SIZE: 250 Patients.

SAMPLING METHOD: Random sampling.

DATA ENTRY FORM:

A specially designed data entry format was used to enter all patients details like patient name, age, sex, weight, inpatient or outpatient number, date of admission, date of discharge, reason for admission, past medical history, past medication history, social habits, vital signs like BP and breathing rate. Provision is given in the

format to enter laboratory investigations, comorbid conditions associated, diagnosis made, drugs for therapy, along with drugs prescribed for cardiac disorders and the drug interactions.

QUESTIONNAIRE:

Information was collected from the patients with the help of two questionnaires: Epworth Sleepiness Scale [ESS] and Stop-Bang questionnaires. Then answers were analysed and severity of SDB was determined. The ESS is a self-administered questionnaire with 8 questions. It provides a measure of a person's general level of daytime sleepiness, or their average sleep propensity in daily life. The ESS ask people to rate, on a 4-point scale, their usual chances of dozing off or falling asleep in 8 different situations. The total ESS score is the sum of 8-item scores and can range between 0 and 24. The higher the score, the higher the person's level of daytime sleepiness.

PATIENT CONSENT FORM:

A patient consent form has also been prepared and written consent was collected from all the patients or the care givers by using patient consent form after providing the information format. The format contains details like address, date, place, provision for signature of the patient or caregivers, investigator and supervisor.

EDUCATING TOOLS:

A patient education folder was designed and printed and explained to the patients to educate on the various aspects of Sleep Disordered Breathing. Since SDB has a positive association with cardiac disorders, this can impair the quality of life in such patients. Hence information to the patients to understand the need for early recognition of SDB to prevent the complications is highly essential.

DATA ANALYSIS:

The obtained data were thoroughly analysed for the severity of SDB in cardiac patients and to assess the risk factors for SDB in such patients.

REPORT SUBMISSION:

The thoroughly analyzed data are to be summarized. The study shall reveal the positive association of SDB and cardiac disorders. The report shall be submitted to the study department.

RESULTS AND DISCUSSION

In this study, 40.8% patients were having diabetes mellitus. This shows a strong association of diabetes with SDB and cardiac disorders. In a similar study conducted by Kamran Mahmood et al, it was examined that the prevalence of type 2 DM was 30.1% in the group with OSA compared in those without OSA. Also SDB is independently associated with glucose intolerance and insulin resistance and may also contribute to the pathogenesis of diabetes.

Examination of other comorbidities showed that 9.2% were having BA/COPD disease, 9.2% patients with CVA and 5.6% patients with hypothyroidism. A study conducted by Mihaela Teodorescu et al found that asthma was associated with an increased risk of new onset OSA.

Examination of the risk factors revealed that 31.2% patients were having chest pain as the major complaint followed by 29.6% patients with complaint of dyspnea. A study conducted by Hagman M et al shows that dyspnea was reported in 21% of the total population and in 70% of the angina population. Dyspnea may form a differential diagnostic symptom to chest pain in ischemic heart disease. Dyspnea was reported in 36% cases who developed angina pectoris and in 35% patients who developed angina pectoris associated with MI.

Analysis of BMI showed that 50.8% patients with normal weight (BMI: 18.5-24.9), 25.8% patients were overweight, 8.4% were obese and 8.8% patients were underweight. In a study conducted by Kohler MJ et al reported that there is an increased risk for OSAS in association with overweight and obesity in adults.

TABLE NO.1 PREVALENCE OF DISEASES (n = 250)

Cardiovascular disorders	Occurrence	Percentage
IHD	48	19.2
SHT	22	8.8
CHF	14	5.6
MI	23	9.2
MI/SHT	11	4.4
IHD/SHT	42	16.8
IHD/CCF	9	3.6
IHD/MI	23	9.2
CHF/SHT	13	5.2
SHT/IHD/MI	23	9.2
SHT/CHF/IHD	22	8.8

**FIGURE NO.1
PREVALENCE OF DISEASES**

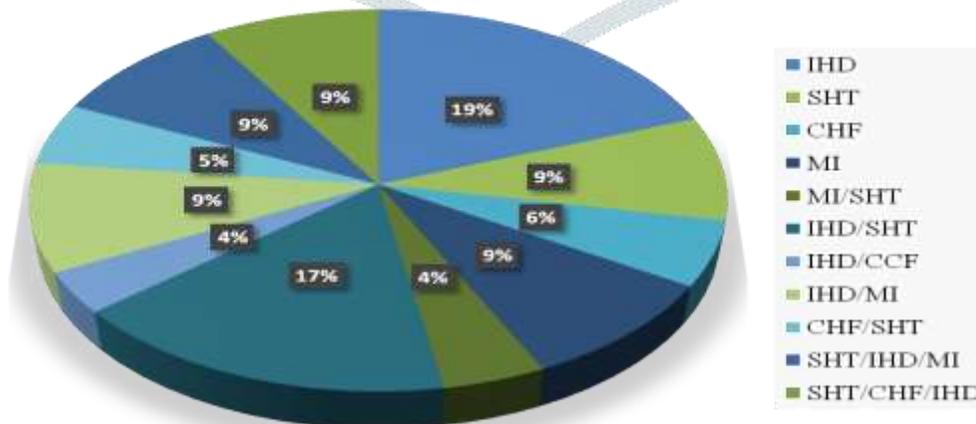


TABLE 2 ASSESSMENT USING EPWORTH SLEEPINESS SCALE

Severity	No. of patients	Percentage
Normal (0-10)	36	14.4
Mild (11-14)	61	24.4
Moderate(15-18)	71	28.4
Severe (19-24)	82	32.8

**FIGURE NO.2
ASSESSMENT USING EPWORTH SLEEPINESS SCALE**

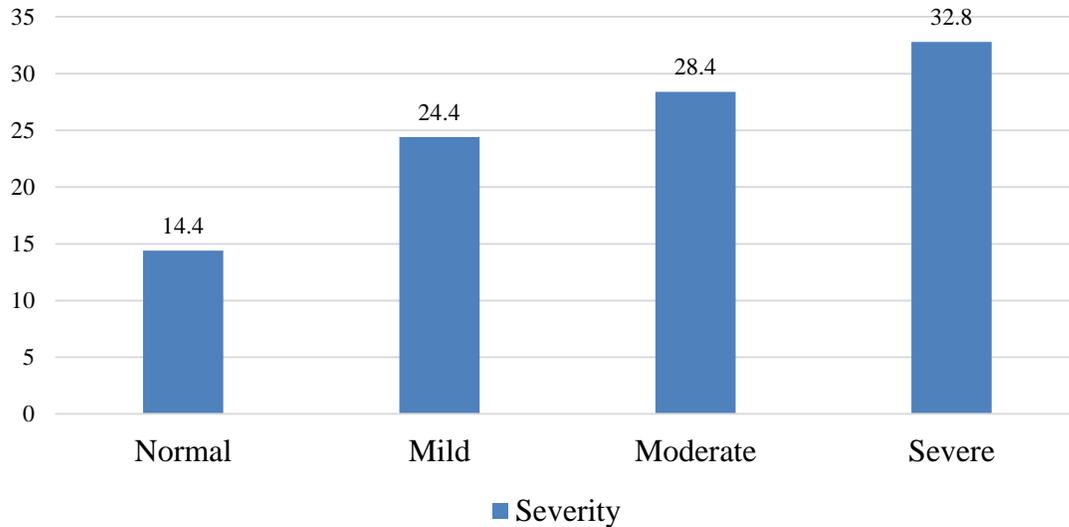


TABLE 3 ASSESSMENT USING STOP BANG QUESTIONNAIRE

Severity	No, of patients	Percentage
Low	44	17.6
Intermediate	116	46.4
High	90	36

**FIGURE NO.3
ASSESSMENT USING STOP BANG QUESTIONNAIRE**

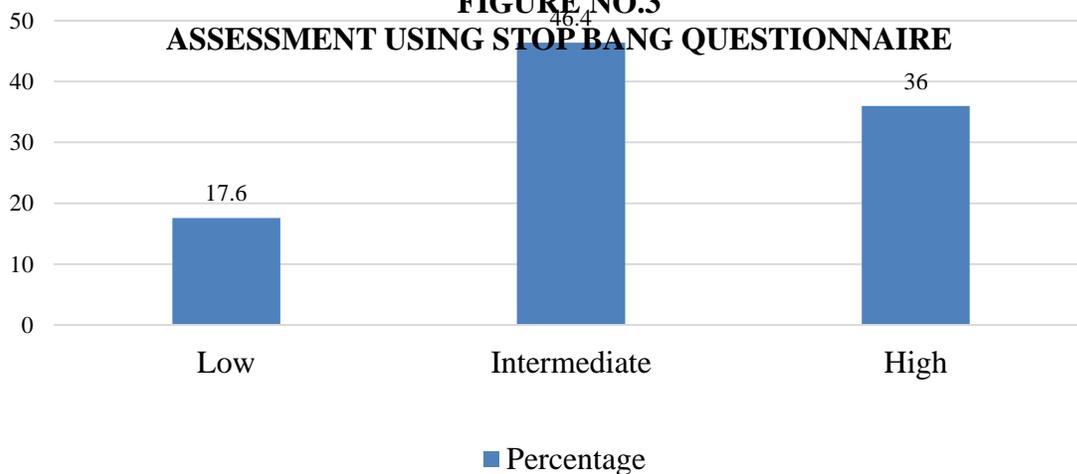


TABLE:4 ASSOCIATION WITH DIABETES

Association	No. of patients	Percentage
Without DM	148	59.2
DM	102	40.8

FIGURE NO.7 ASSOCIATION WITH DIABETES

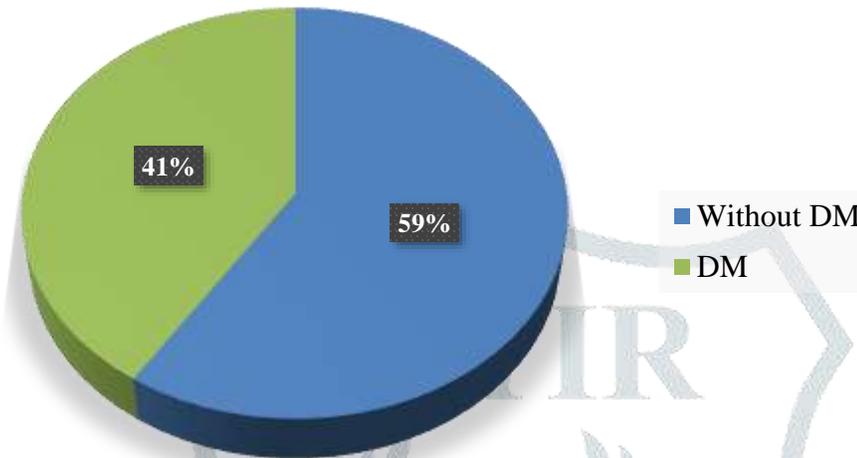
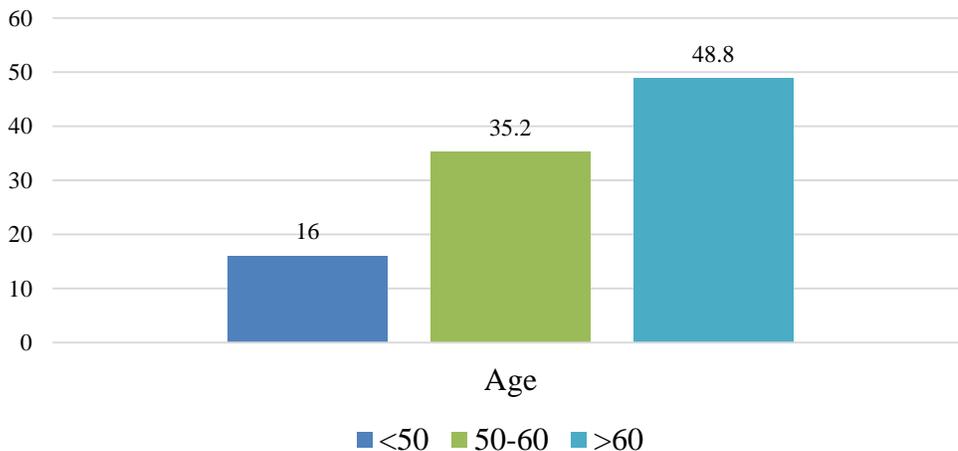


TABLE:5 ASSOCIATION WITH AGE

Age	No. of patients	Percentage
<50	40	16
50-60	88	35.2
>60	122	48.8

FIGURE NO.5 ASSOCIATION WITH AGE



- The study results revealed that (40.8%) observed were affected with diabetes mellitus and thus diabetes has a strong association with cardio vascular disorders.
- When association with other disease conditions was examined it had found that (9.2%) patients have

BA/COPD as the comorbid condition, followed by CVA(9.2%).

- Further analysis shows that (31.2%) patients had chest pain as major reason for admission followed by (29.6%) patients with dyspnea. This reveals an association between SDB and cardiac disorders.
- Analysis of BMI shows that (50.8%) patients bearing normal weight whereas (26.4%) patients with overweight and (8.4%) were found to be obese.
- The results showed that there is a positive association between SDB and cardiac disorders.

The results demonstrated an increased risk for SDB in cardiac disorders and vice versa. It is necessary to make aware of the cardiac patients about the SDB condition in them. Early recognition of SDB is necessary to treat those patients with CPAP as it will improve the quality of life.

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