Sleep-disordered Breathing in Uncontrolled Blood Pressure: Our Experience

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ABSTRACT

Introduction: Sleep-disordered breathing is one of the greatest health problems. It comprises of obstructive sleep apnea, central sleep apnea, periodic breathing, and upper airway resistance syndrome. There are several studies reporting association of uncontrolled blood pressure with individuals having sleep disordered breathing. Data regarding this were sparse in developing countries. Therefore this study was performed to find out the sleep-disordered breathing among uncontrolled hypertensive patients.

Materials and Methods: Study was performed from January, 2014 to January, 2017 in sleep center in Kathmandu, Nepal. Patient with uncontrolled BP were included. Uncontrolled BP was defined as blood pressure >130/80 mmHg not on intensive antihypertensive regimen and resistant elevated BP was defined as blood pressure >130/80 mmHg despite intensive antihypertensive regimen. These patients were subjected for polysomnography.

Results: Three hundred patients were selected out of which 250 patients with uncontrolled blood pressure were included. They were subjected for overnight polysomnography. Among them, 70 patients (28%) were found to have mild obstructive sleep apnea, 20 patients had moderate obstructive sleep apnea (8%) and 15 had severe obstructive sleep apnea (6%).

Conclusions: This study concludes that those individuals having uncontrolled blood pressure has obstructive sleep apnea and these individuals have to undergo polysomnography.

Keywords: Apnea; Obstructive sleep apnea; Hypertension; Polysomnography
MATERIALS AND METHODS

This is a hospital-based cross-sectional study from January, 2014 to January, 2017 done in Swaccon National Hospital and Sleep Care Center, Kathmandu, Nepal. Permission was obtained from ethical committee. Patients referred from different centers in Kathmandu who had uncontrolled hypertension were included and those with concomitant cardiac failure (ejection fraction <30%) and acute coronary syndromes were excluded.

Out of the total, 250 patients with uncontrolled hypertension were included. Subjects were recruited using Epworth Sleepiness Scale (ESS) questionnaire. All the patients were evaluated by cardiologist and ophthalmologist. Elevated BP was defined a systolic Blood Pressure (SBP) ≥ 130 mmHg or Diastolic Blood Pressure (DBP) ≥ 80mmHg. Uncontrolled elevated BP was defined as SBP ≥ 130mmHg or DBP ≥ 80mmHg without use of an intensive antihypertensive regimen IAR (≥ 3 antihypertensive with 1 being a diuretic). Controlled BP was defined as SBP < 130 mmHg or DBP <80mmHg. Demographic data including age, sex, Body Mass Index (BMI), history of diabetes, smoking history, and medication for hypertension were collected in structured Performa after informed consent. Subjects who met inclusion criteria underwent overnight level IV polysomnographic test using ALICE 5 done in sleep lab after written consent. Polysomnography reporting was done by certified sleep physician.

Statistical Analysis

Analysis was performed using a statistical software package (SPSS 22 for windows). Nominal variables were compared using Chi-square test or Fisher’s exact test. Step wise multivariate logistic regression was performed with potential candidate variables as covariates. All the statistical tests performed were two tailed; p<0.05 was considered statistically significant.

RESULTS

A total of 250 patients with uncontrolled BP were included. Among them, 140 were males and 110 were females. Mean age of patient was 62.5 ±5.9 years. Among the studied population, sixty five (24%) patients had BMI ≥ 30 and 35 patients (14%) were diabetics. (Table 1) All the patients were subjected for overnight polysomnography. Among them 105 had OSA - 70 (28%) patients had mild OSA, 20 (8%) patients had moderate OSA, and 15 (6%) patients had severe OSA. (Table 2) On logistic regression analysis, not adjusted for age, sex, BMI, nor smoking, severe OSA was associated with uncontrolled hypertension (OR 2.05 , 95% CI (1.69-8.83) P=0.02) (Table 3)

DISCUSSION

The main finding of this study was that SDB is more prevalent in hypertensive men. The results confirm the findings of previous smaller studies in which hypertensive and non-hypertensive subjects have been compared for the prevalence of SDB.5,7,8 Fletcher and coworkers compared 46 hypertensive men taken off medication with 34 age and weight matched normotensive control subjects. An Apnea-Hypopnea Index (AHI)>10 was found in 30% of the hypertensive subjects and in 9% of the controls.9 In the Sleep Heart Health Study, a prospective population-based cohort study, patients with AHI>15 had three times the odds of having hypertension at baseline compared to controls. After adjusting for demographics and anthropometric variables, odds ratio (OR) for hypertension for those with AHI ≥30 was 1.37 (95% confidence interval (CI), 1.03–1.83).2Heart Biomarker Evaluation in Apnea Treatment (HeartBEAT) study, a 4-site randomized controlled trial, found 3-fold higher odds of resistant elevated BP (OR 2.75, 95% CI 1.23-6.14, p = 0.01) in the severe OSA group in the model adjusted for age, sex, race, BMI, smoking, diabetes mellitus, and CVD.10

Limitation of this study is that the BP was measured only once in outpatient visit in most of the participants. Twenty four hour ambulatory BP monitoring may help to provide prognostic value.
Cardiovascular disease status was not considered as confounding factors. Dosage of medications and compliance with medication were not included in the analysis.

CONCLUSIONS

Sleep-disordered breathing is more prevalent in men with uncontrolled hypertension. AHI is independent predictors of uncontrolled hypertension irrespective of confounders. The results indicate that uncontrolled hypertensive patients are more prone to have sleep apnea. Therefore polysomnography is recommended to rule out SDB in uncontrolled hypertensive patient.

REFERENCES