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Original Research Article

Utility of the Epworth sleepiness scale: Hindi version in identifying obstructive sleep apnoea in adult patients with symptoms of sleep disordered breathing in a tertiary care centre

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ABSTRACT

Background: Excessive daytime sleepiness is a key symptom in patients with sleep- breathing disorders (SBD) and represents a new major public health issue due to its repercussions. The ESS is a simple and validated method, which measures the probability of falling asleep in a variety of situations. Aims and objectives is to study the accuracy of the Epworth Sleepiness Scale (ESS) questionnaire in the identification of Obstructive Sleep Apnoea (OSA) in patients with symptoms of sleep disordered breathing in a tertiary care centre.
Methods: This present study was conducted in the Department of Respiratory medicine, New Medical College, Kota on 70 adult patients who presented with symptoms of Sleep Disordered Breathing and underwent Type 2 Polysomnography after answering Epworth sleepiness score in Hindi Language.
Results: Epworth sleepiness scale has predicted excessive day time sleepiness in 60% of study subjects with ESS score more than 10 taken as cut off. Mean value for ESS in the study was 10.78. 35.71% of the patients had severe OSA diagnosed by polysomnography and 30% patients had moderate OSA. Mild OSA was detected in 7.14% patients. Sensitivity of the ESS score >10 in diagnosing OSA was found to be 72.5%. Specificity of the scale was 73.6%.There was significant correlation between ESS score and diagnosis of OSA (p value <0.001).
Conclusions: The study concludes that ESS has got good relevance in predicting OSA in patients with sleep disordered breathing.

Keywords: Epworth sleepiness scale, Excessive daytime sleepiness, Polysomnography, Positive airway pressure

INTRODUCTION

Sleep disordered breathing (SDB) has become a common medical disorder associated with many co morbidities. Nowadays this condition is being increasingly recognized, probably due to better awareness among patients and treating physicians as well as higher utilization of sophisticated diagnostic techniques. Excessive daytime sleepiness is a major symptom in patients with sleep disordered breathing (SBD) and represents a new major public health issue due to its repercussions. The most prevalent sleep breathing disturbance is Obstructive sleep apnea. Sleep apnea events are defined as complete cessation of breathing (apnoea) or a marked reduction in airflow (hypopneas) during sleep and are considered relevant if they last for more than 10 seconds.[1,2]

OSA is being considered as an independent risk factor for hypertension, glucose intolerance/ diabetes mellitus, cardiovascular diseases and stroke, leading to increased cardio metabolic morbidity and mortality.[3] This condition affects 3-7% males and 2-5% females in the 30 to 60 year

age group in western countries and Asia, including India.[4,5] Epidemiological studies have demonstrated that this condition is two-three times more common in males as compared to females.[6] Episodes of apnoea can be obstructive (absence of airflow and continued respiratory effort), central (absence of airflow and respiratory effort) or mixed apnoea. Mixed apnoea usually starts as a central event and then becomes obstructive during later part of the same episode. The Apnoea hypopnea index (AHI) is calculated as total no of respiratory events (apnoea and hypopnea) averaged per hour of sleep. Its calculated by adding number of apnoea and hypopnea episodes and dividing this value by the total number of hours of sleep.[7,8]

Polysomnography is considered the gold standard for evaluation of OSA and it provides data on respiratory effort, airflow, oxygenation and sleep stages and other variables. AHI <5 is considered normal, AHI values 5-14.9 is considered mild OSA, AHI value 15-29.9 is considered as Moderate OSA. AHI value ≥30 is considered as severe OSA. Excessive day time Sleepiness is considered to be a consequence of sleep fragmentation and has been associated with loss of attentiveness.[9] The Epworth Sleepiness Scale (ESS) is an effective questionnaire used to detect day time sleepiness.[10] The patient self-rates on how likely it is that he/she would doze in eight different situations. Scoring of the answers is 0-3, with 0 being–would never doze and 3 being –high chance of dozing. Total score of ESS more than 10 indicates excessive day time sleepiness and need for further evaluation.[10,11]

Aims and objectives was to study the utility of the Epworth Sleepiness Scale (ESS) questionnaire in the identification of Obstructive Sleep Apnoea (OSA) in comparison with Polysomnography as gold standard in patients with symptoms of sleep disordered breathing in a tertiary care centre.

METHODS

This cross-sectional study was conducted in Department of Respiratory medicine Government Medical College Kota over a period of one year from July 2018 to June 2019. Study was conducted on 70 adult patients with sleep disordered breathing.

Inclusion criteria

- All patients with symptoms of sleep breathing disorder who are offered Polysomnography with age more than 18 years and who consented to take part in the study.

Exclusion criteria

Authors excluded patients who were not consenting for taking part in the study, age less than 18 years, and patients not able to take part in study physically or mentally or give appropriate answer to questionnaire. After taking an informed consent a thorough history was taken including cardinal symptoms of the patient and sleep history.

Age, gender, sex and weight of the patient were noted. The socio-demographic history, family history, smoking history and history were recorded. Physical examination and necessary laboratory investigations were done to rule out other co morbidities. Then an Epworth Sleepiness Scale (ESS) questionnaire in local language (Hindi) was given to the patients and they were asked to fill it. Level 2 polysomnography was done for all the patients. Following polysomnography, the final manually scored Apnoea-Hypopnoea Index (AHI) was documented. For comparison of means between ESS score and AHI; OSA and Normal group, the student t test, chi- square test and analysis of variance (ANOVA) were applied. All the above mentioned tests were applied using SPSS version 16 software and SAS JMP v 15 software.

RESULTS

Mean age of the study population was 47.08 years (Standard deviation 5.49). Study subjects were between age group of 27-55 years. Majority of the subjects who presented with symptoms of sleep disordered breathing in this hospital belongs to the age group between 41-50 years. Number of male's subjects (91%) were more than female subjects. Mean BMI of the study subject was 24.58 Kg/m^2. Mean value neck circumference among study population was 37.87 cm (14.89 inch). Mean value of ESS score for the study population was 10.78. Snoring was the most common symptom among study subjects (64%). Excessive day time sleepiness was present in 54% of the subjects. Behavioural change and chest pain were the least common among symptoms.

At which 51 subjects (72.85%) had AHI score more than 5 and hence were diagnosed as OSA. Mean AHI score was 30.25. Patients were grouped into OSA and Non OSA subjects. ESS score 10 was taken as cut off value. Authors found out 51 subjects had OSA of which 37 subjects had ESS score more than 10 (True Positive) other 14 subjects had ESS score ≤10 (False Negative). 19 subjects were Non OSA subjects, Of which 14 subjects had ESS score ≤10 (True Negative) and 5 subjects had ESS score more than 10 (False Positive). Chi square analysis of this data suggest significant correlation between ESS score and diagnosis of OSA (p value of <0.001).

Among 25 severe OSA (AHI score ≥30) subjects 22 subjects had ESS score more than 10 (88%) and among 21 moderate OSA subjects 15 subjects had ESS score of more than 10. All the 5 subjects that had mild OSA, their ESS score was less than 10.

ESS score >10 has a sensitivity of 72.55% and Specificity of 73.6%, Positive predictive value of 88%and negative predictive value of 50% in predicting OSA. Prevalence of disease among study population was 72.86%. Area under curve was 0.89.

DISCUSSION

Mean age of study population was 47.05 with standard deviation of 5.49. Age of the patient were grouped, and maximum number of patients were in the age group between 41-50 years (61.4%). Mean age of patients with OSA was 46.66 and that of normal patients were 48.21. From this study authors infer that Age group has no significant relation with AHI value (p value >0.05). Venkatesh Vulli et al, did report the mean age of their study population was 53.82 years (p value 0.427). Fortune O Alabi et al, also reported similar finding in their study (p value 0.16).[12,13]

Mean ESS score for Female was 12.16 and for male subjects was 10.65. Maximum score was 20 and minimum score was 3. Mean ESS score for Normal subjects was 6.52 and that for OSA patients was 12.37. Puru Koirala et al, in their study found Mean ESS score for study population was 12.32.[14] Upon analysis of relationship between gender and diagnosis of OSA authors did not find significant relationship between Gender and OSA (p value 0.527). In this study excessive day time sleepiness (p value 0.040) and Morning headache (p value 0.026) were found to be significant in predicting ESS score more than 10.Snoring was found to have Positive correlation with OSA in the study population with Chi square value 16.37 (p value <0.001). Mean value of lowest O2 saturation for severe OSA group was 67%, whereas for moderate it was 84% and mild OSA the value was 89.4%. Mean spO2. Number of O_2 desaturation episodes and duration of SpO2 below 90% all were found significant correlation with ESS score for predicting OSA (p value <0.001).

ESS value more than 10 was suggestive of Excessive day time sleepiness and indicative of OSA. ESS score more than 10 was found in 42 subjects (60%), Value was ≤10 in 28 subjects (40%). Authors found positive correlation between ESS score and diagnosis of Splitting data table of OSA /Non OSA versus ESS score >10/ESS score ≤10. Authors found that Pearson coefficient Chi SQ value 12.329 P value 0.0004 which is statistically significant with an odds ratio of 7.4. Area under curve (AUC) -0.89. Authors infer that ESS has good predictability of OSA with a cut of value 10.Similar observations were made by study conducted by Puru Koirala et al, where they found AUC 0.66, Pataka et al, in their study found ESS score to statistically significant in predicting OSA with an odds ratio of 2.4 (AUC 0.66). From this study Authors found that ESS score >10 has sensitivity of 72.55%, Specificity of 73.68%, Positive Predictive Value 88.10%, Negative Predictive Value 50% in identifying OSA patients.[14,15] Venkatesh Vulli et al, in their study found ESS score having a sensitivity of 73% and specificity of 60%. Puru Koirala et al, in their study found ESS to have a sensitivity of 86% and specificity of 45 %.[12,14] Iman Hassan El Sayed in their study found ESS score to have sensitivity of 72.55% and Specificity of 75%.[16] Categorization into mild, moderate, severe OSA based on AHI value and response of ESS score more than 10 also has good correlation (p value <0.0001)

CONCLUSION

This study concludes that the Epworth Sleepiness Scale has good utility in predicting the presence of sleep related breathing disorder in patients with symptom complex of sleep disordered breathing who visit the routine respiratory clinical services. Hindi version of Epworth Sleepiness Scale can be used in routine respiratory clinical care to predict presence of sleep related breathing disorder and refer them to clinical sleep services for further evaluation. ESS score cut off of 10 had a sensitivity of 72.5% and specificity of 73.68% in this study.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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