



THE SLEEPSTRIP VERSUS CARDIORESPIRATORY 8-CHANNELS MONITORING DEVICE IN THE EARLY SCREENING OF SLEEP DISORDERED BREATHING (SDB)

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Introduction

• Sleep Disordered Breathing (SDB) is a common disorder affecting 2% of females and 4% of males in the adult population (1, 2).

• SDB is associated with increased morbidity and mortality mainly from cardiovascular causes (3). Moreover, SDB patients with excessive daytime sleepiness are at higher risk for motor and work-related accidents.

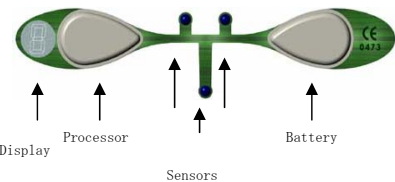
• However, it has been estimated that the vast majority of these patients remain undiagnosed.

• Ambulatory monitoring techniques are particularly useful for screening SDB, and they are widely used especially in Europe.

• Recently, SleepStrip (SLP, Israel) a reliable low cost disposable, was developed for the screening of sleep apnea.

• The device consists of a flow-sensor (oral and nasal thermistor), real time analysis hardware and software and a miniature display unit.

• Events are identified and counted if a decrease or complete cessation of respiration is recorded. After at least five hours of recording, the SS score, which represents the number of respiratory events per hour of recording, is computed and displayed.



• SS scores range from 0 to 4.

- 0: normal SDB (<=14 events/h)
- 1: mild SDB (15-24 events/h)
- 2: moderate SDB (25-40 events/h)
- 3: severe SDB (>=40 events/h)
- E: error

Objectives

• To assess the accuracy of the SleepStrip (SLP, Israel) device, a low cost disposable sleep apnea screener, versus a validated monitoring system, the Polymesam (MAP, Germany) for the portable cardiorespiratory screening of patients with suspected SDB.

Methods

Subjects

• 33 consecutive adult patients (5 F; 28 M) referred to our Sleep Disorders Center for suspected SDB, entered the study.

• Mean age was 46.5 ± 12.8 yrs (range: 32-68 yrs.) and the mean BMI was ... (range: 22 - 34)

• All subjects underwent one night of simultaneous use of the SleepStrip (SS) and of the Polymesam (PM).

• Patients were instructed by a technician on how to position SS before bedtime.

• SS automatically derived score was collected for every patients.

• Polymesam recordings were visually analyzed by expert scorers who were blind to the SS final score, and the Apnea/Ypopea Index (AHI, number of Apnea/Ypopea per hour of recording) was calculated.

Statistical procedures

• Based on AHI, patients were divided in three categories: mild SDB (AHI=15-24), moderate SDB (AHI 25-39) and severe SDB (AHI=>40).

• Pearson product-moment correlation was computed between AHI and SS scores.

• Sensitivity, specificity, positive predictive value and negative predictive value were calculated for SS scores from 1 to 3.

Results

• One subject was removed from analysis due to insufficient total recording time.

• We had no equipment failure and all patients showed a good compliance to the device.

• Correlation between SS scores and AHI was $r=0.85$, $p<0.001$.

• Measures of accuracy using the SS score categories (mild≥1, moderate≥2, severe=3) versus the AHI categories (mild≥15, moderate≥25, severe≥40) are shown in Table 1.

Table 1: accuracy measures of the SS score categories (mild≥1, moderate≥2, severe=3) compared to AHI categories (mild≥15, moderate≥25, severe≥40).

	Mild	Moderate	Severe
Sensitivity	0.81	1.00	0.71
Specificity	0.67	0.90	1.00
Positive predictive value	0.72	0.83	1.00
Negative predictive value	0.77	1.00	0.92
Overall accuracy	0.74	0.94	0.94

Table 2: sensitivity values using the SS score threshold held constant at mild or above against three RDI thresholds (mild≥15, moderate≥25, severe≥40).

	Mild	Moderate	Severe
Sensitivity	0.81	1.00	1.00

Conclusions

• Regardless of the cutoff method used, measures of accuracy were very high, particularly when the SS score threshold was held constant at mild and above.

• We conclude that the SS seems to be a useful tool that enables physicians to confirm or reject the suspicion of SDB, as well as to determine the severity of the condition.

• The early diagnosis and treatment of patients with SDB may improve both management strategy and quality of life.

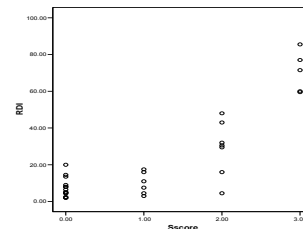


Figure 1: ...

References

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