Use of the STOP-Bang Screening Tool to determine the prevalence of Obstructive Sleep Apnoea in an outpatient General Cardiology Population

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Introduction

Obstructive Sleep Apnoea (OSA) is a common condition, characterised by repetitive episodes of nocturnal breathing cessation due to upper airway collapse. Disease severity is characterised by the apnoea-hypopnoea index (AHI). The AHI, in combination with patient symptoms and other medical history determine management with night-time continuous positive airway pressure (CPAP). An AHI of 5-15 gives a diagnosis of mild OSA, while a grade of 15-30 is classified as moderate, and ≥30 equates to severe disease. OSA is a well-recognised risk factor for coronary artery disease (CAD), atrial fibrillation (AF) and hypertension (HTN) due to intermittent hypoxia,
inflammation, oxidative damage, endothelial and sympathetic dysfunction.
We undertook to determine the prevalence of OSA in an unselected general cardiology outpatient cohort, using the STOP-Bang screening tool. Further, we evaluated the diagnostic accuracy of the test in this population by comparison with sleep-study testing.

Figure 1:

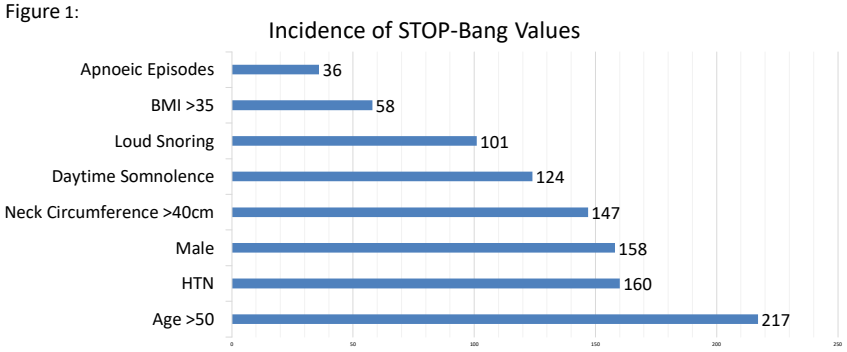

Figure 1: Incidence of the STOP-Bang data points among our assessed population.

Methods and Materials

We distributed a modified STOP-Bang questionnaire to patients attending our general cardiology clinic. The tool contained all eight STOP-Bang data points along with a consent for onward referral for sleep-studies. We also asked about a prior diagnosis of OSA. Trained nursing staff measured patient weight, height, and neck circumference. The screening process was undertaken for all patients over the age of 18. We collected 250 completed patient questionnaires who gave consent, aiming for an uptake of over 80%.

We categorized patients based on previously defined risk profiles, generated by their STOP-Bang scores. The low and high-risk categories were based on literature review and other cohort validations. Low risk was defined as a score of 0-4, High risk ≥ 5 OR 4 with a STOP score ≥ 2 AND ONE of male sex, neck circumference ≥ 40cm or body mass index (BMI) ≥ 35.

We referred 47 patients for sleep-studies to validate the tool, 23 high-risk patients and 24 low risk patients. Those who attained an AHI of ≥15 were categorised as positive.

Figure 1:

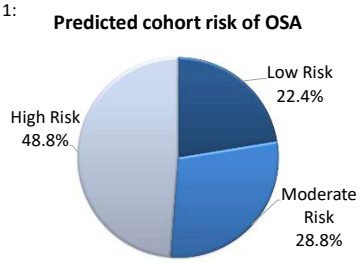

Figure 2: Pie chart representation of risk categories of our sample population, an impressive 48.8% of general cardiology patients were deemed to be high risk of moderate-severe OSA as per our randomised STOP-Bang assessment.

Results

We distributed 287 forms to sequential patients during the study. 250 patients completed the form and gave informed consent for sleep studies and 37 were excluded due to consent/form refusal. This gave us an uptake of over 87%. 119 (47.6%) of our 250 were categorised as high risk.

Total patients referred for sleep studies, n=47. Of our high-risk patients n=23, n=17 had an AHI ≥15 with n=6 having <15. Of our low-risk category, n=22 patients had an AHI <15 and n=2 patients ≥ 15. Therefore, those categorised as high-risk on our screening tool yielded a sensitivity of 89.5% (95% C.I. 65.5%-98%) and a specificity of 78.6% (95% C.I. 58.5%-91%) for the presence of moderate-severe OSA requiring CPAP.

Conclusions

We found a large volume of high-risk patients in our general cardiology population using the STOP-Bang assessment tool, and a high prevalence of OSA when confirmed with sleep studies.

The tool had a high sensitivity (89.5%) and moderate specificity (78.6%) for moderate-severe OSA. We recommend utilizing the STOP-Bang questionnaire as a suitable screening tool in this population, especially for diagnosis of moderate-severe OSA, for ongoing cardiovascular risk factor modification.

Table 1:

STOP-Bang Score	Patients (sum)	Males (% of total)	BMI (mean)	Neck- cm (mean)	Age (mean)	Weight - kg (mean)
0	1	0	21.8	31	45	56.5
1	22	0.4	26.15	34.39	58.14	69.87
2	33	30	27.08	39.94	65.76	74.23
3	36	55	28.39	38.82	64.75	79.48
4	56	73	29.29	41.79	64.09	85.78
5	53	79	30.27	42.66	69.08	87.66
6	34	91	32.56	44.34	64.74	96.76
7	11	81.8	32.86	44.86	66.64	96.75
8	4	100	43.38	54.75	61.75	129.45
Overall	250	63%	29.6	40.9	65.02	84.9

Table 1: Breakdown of patient cohort, for each STOP-Bang score 0-8, and finally over all 250 patients.

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