Validation of the STOP-Bang Questionnaire as a Screening Tool for Obstructive Sleep Apnea among Different Populations: A Systematic Review and Meta-analysis

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Introduction

- The diagnosis of patients with suspected obstructive sleep apnea (OSA) is important because of the increased risk of perioperative complications.
- Polysomnography (PSG) - the gold standard for diagnosis of OSA – may be time consuming and costly.
- The STOP-Bang questionnaire is a validated screening tool for obstructive sleep apnea.
- We conducted a systematic review and meta-analysis to determine the effectiveness of STOP-Bang for screening OSA patients in the different population.

Methods

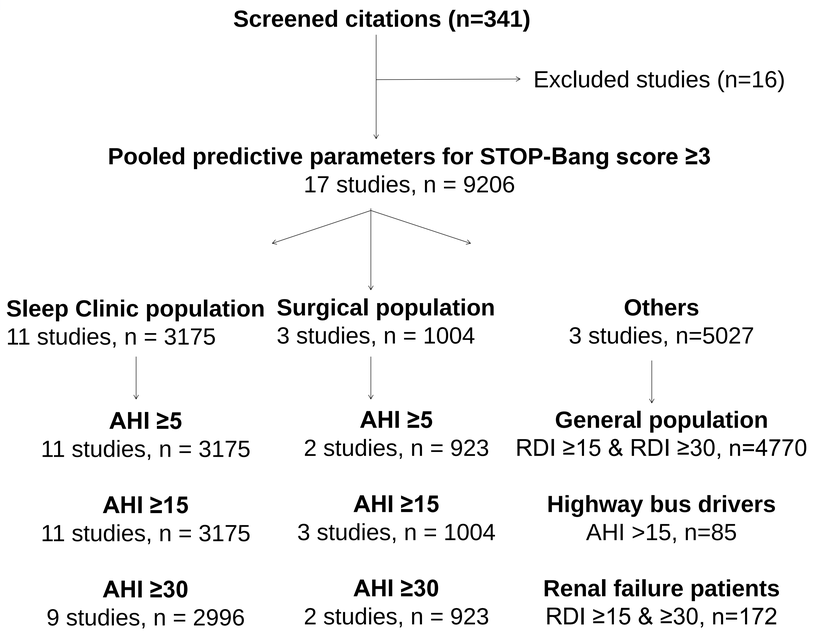
- **Literature Databases searched** (From 2008 to January 2015)
- MEDLINE
- Medline-in-process & other non-indexed citations
- Embase
- Cochrane Central Register of Controlled Trials
- Cochrane Databases of Systematic Reviews
- Google Scholar
- Web of Sciences
- Scopus
- PubMed
- **Inclusion Criteria**
- The study used the STOP-Bang questionnaire as a screening tool for OSA in adult subjects >18 years
- The accuracy of the STOP-Bang questionnaire was evaluated by comparing its results with the results of a polysomnogram (PSG either laboratory or portable) as a gold standard for diagnosing OSA
- OSA was defined as apnea hypopnea index (AHI) or respiratory disturbance index (RDI) ≥5
- The STOP-Bang questionnaire and full-text papers were written in English language.

Results

Table 1: Pooled Predictive parameters of STOP-Bang ≥3 questionnaires for screening OSA

Predictive parameters	Mild OSA AHI ≥5	Moderate-to-Severe OSA AHI ≥15	Severe OSA AHI ≥30
Sleep clinic population			
	(11 studies, n = 3175)	(11 studies, n = 3175)	(9 studies, n = 2996)
Prevalence	85.0 (84.0-86.0)	64.0 (62.0-65.0)	42.0 (40.0-43.0)
Sensitivity	90.0 (88.0-91.0)	94.0 (93.0-95.0)	96.0 (95.0-97.0)
Specificity	49.0 (45.0-54.0)	34.0 (31.0-36.0)	25.0 (23.0-27.0)
Positive predictive value	91.0 (90.0-92.0)	72.0 (70.0-74.0)	48.0 (46.0-50.0)
Negative predictive value	46.0 (41.0-50.0))	75.0 (71.0-79.0)	90.0 (87.0-93.0)
Diagnostic odds' ratio	8.3 (6.1-9.7)	7.2 (5.7-9.0)	7.2 (5.1-10.2)
SROC	0.74	0.78	0.72
Surgical population			
	(2 studies, n = 923)	(3 studies, n = 1002)	(2 studies, n = 923)
Prevalence	68.0 (65.0-71.0)	39.0 (36.0-42.0)	19.0 (21.0-27.0)
Sensitivity	84.0 (81.0-87.0)	91.0 (87.0-93.0)	96.0 (92.0-98.0)
Specificity	43.0 (38.0-49.0)	32.0 (28.0-36.0)	29.0 (26.0-33.0)
Positive predictive value	76.0 (73.0-79.0)	46.0 (42.7-50.0)	23.0 (21.0-27.0)
Negative predictive value	55.0 (48.8-62.0)	84.0 (79.0-88.0)	97.0 (94.0-99.0)
Diagnostic odds' ratio	4.46 (2.5-7.96)	4.08 (1.58-10.53)	11.31(2.07-61.7)
SROC	0.64	0.68	0.63
General population			
		(1 study, n=4770)	(1 study, n=4770)
Prevalence	-	13.0 (12.0-14.0)	7.0 (7.0-8.0)
Sensitivity	-	88.0 (86.0-91.0)	93.0 (90.0-95.0)
Specificity	-	30.0 (29.0-31.0)	30.0 (28.0-31.0)
Positive predictive value	-	16.0 (14.3-16.7)	9.0 (8.3-10.3)
Negative predictive value	-	95.0 (93.4-95.9)	98.0 (97.2-98.7)
Diagnostic odds' ratio	-	3.3 (2.5-4.2)	5.2 (3.4-7.9)
SROC	-	0.59	0.61

Figure 1: Flow chart for data collection and grouping of the studies



Summary & Conclusion

▪The STOP-Bang questionnaire has been validated to be an excellent screening tool for OSA in sleep clinic, surgical and general populations.

▪A STOP-Bang score of 0-2 has a high negative predictive value for assessing the likelihood of moderate or severe obstructive sleep apnea, which can be used to mitigate the need for polysomnography.

Reference

Chung et al Anesthesiology. 2008;108: 812–21.

•*The research work was funded by University Health Network-Department of Anesthesia, Toronto Western Hospital, University of Toronto, Toronto, Ontario, Canada.*