



Validity of Home Sleep Apnea Testing in an Active Duty Military Population

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Background

- Obstructive sleep apnea (OSA) is the most frequently diagnosed disorder among military personnel referred for sleep evaluations¹⁻³
- The gold standard for OSA diagnosis is an attended, overnight in-laboratory polysomnography (PSG)⁴
- However, PSG testing is time consuming, expensive, resource intense and limited in availability
- Home sleep apnea test (HSAT) is more convenient, less expensive and resource intense, and can be easily implemented
- Current data supporting HSAT use have been found within the general population⁵ and veterans⁶ but use within an active duty military population has not been well studied
- Study Purpose:** Examine the validity of HSAT to accurately diagnose and classify the severity of OSA in an active duty military population

Methods

- IRB approved, **retrospective cohort study** at Madigan Army Medical Center between December 2018 and February 2020
- All military personnel referred to Sleep Medicine with a clinical suspicion for OSA underwent HSAT followed by an in-laboratory PSG
- HSAT utilized in our study is the **WatchPAT 200** which uses peripheral arterial tonometry to indirectly evaluate for apneas and hypopneas in the diagnosis of OSA
- Exclusion criteria:
 - HSAT total sleep time < 4 hours
 - Time between HSAT and PSG > 120 days



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Results

Table 1: Patient Demographics

	Total	AHI < 5/hr	AHI ≥ 5/hr	P Value
No. of subjects	208	76 (36.5%)	132 (63.5%)	--
Gender				
Male	188 (90.4%)	67 (35.6%)	121 (64.4%)	0.41
Female	20 (9.6%)	9 (45.0%)	11 (55.0%)	0.41
Age, years (mean ± SD)	34.2 ± 8.0	31.7 ± 7.5	35.6 ± 8.0	0.001*
BMI, kg/m ² (mean ± SD)	28.2 ± 3.8	27.0 ± 3.6	29.0 ± 3.7	<0.0001*
Comorbid diagnoses:				
HTN	18 (8.7%)	6 (33.3%)	12 (66.7%)	0.77
GERD	13 (6.3%)	6 (46.2%)	7 (53.8%)	0.46
PTSD	17 (8.2%)	7 (41.2%)	10 (58.8%)	0.68
Insomnia	53 (25.5%)	22 (41.5%)	31 (58.5%)	0.38
TBI	10 (4.8%)	4 (40.0%)	6 (60.0%)	0.82
Other Psychiatric Disorder	49 (23.6%)	24 (49.0%)	25 (51.0%)	0.04*
STOP Score (mean ± SD)	2.2 ± 0.8	2.2 ± 0.8	2.2 ± 0.8	0.92

Figure 1: ROC Curve

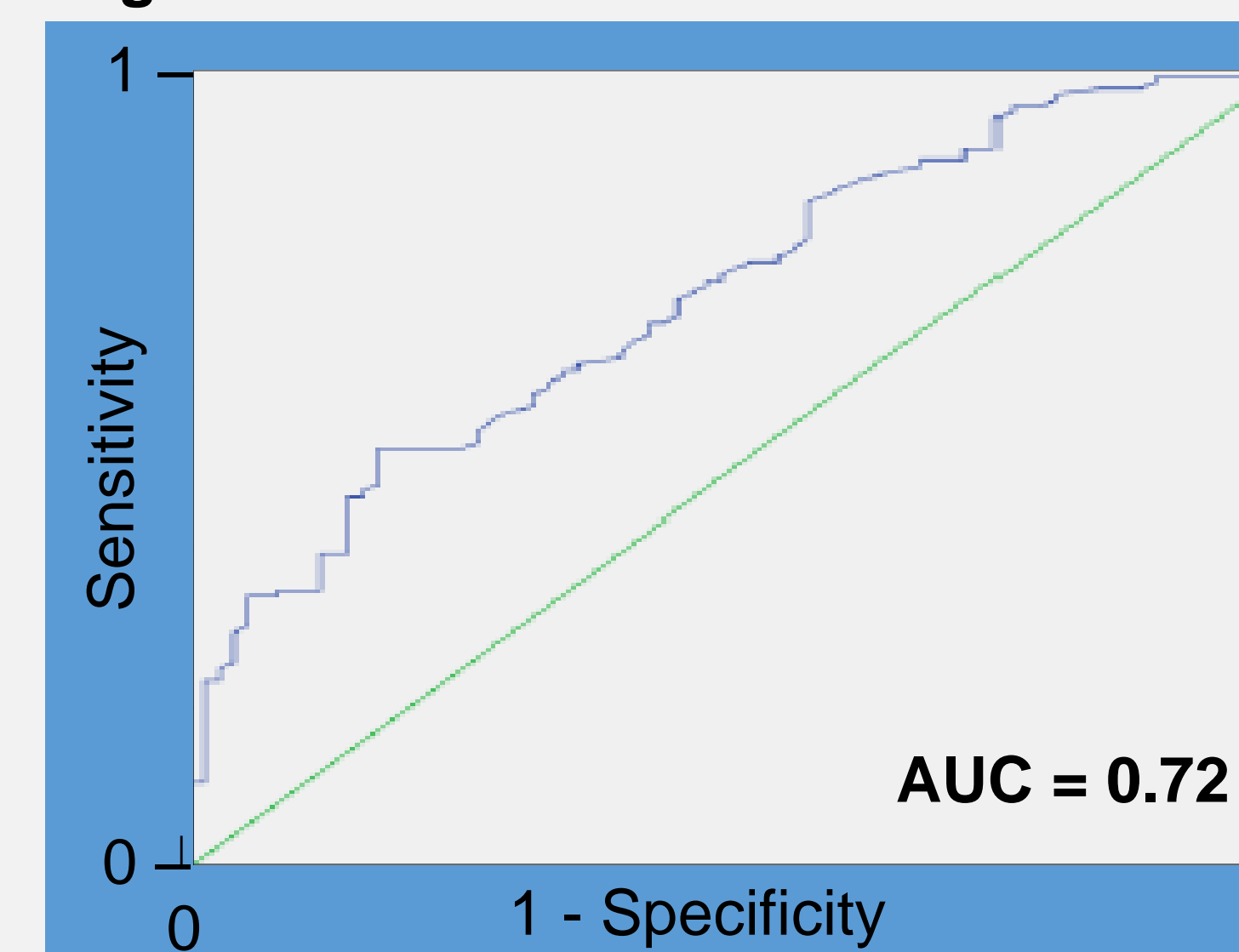


Table 2: OSA Diagnosis

	PSG AHI ≥ 5	PSG AHI < 5	Total
HSAT REI ≥ 5	98	37	135
HSAT REI < 5	34	39	73
Total	132	76	208

Table 3: Sensitivity and Specificity

HSAT Threshold	Sensitivity (95% CI), %	Specificity (95% CI), %	Predictive Value (95% CI), %		Likelihood Ratio (95% CI)	
			Positive	Negative	Positive	Negative
REI ≥ 5	74.2 (65.9-81.5)	51.3 (39.6-63.0)	72.6 (67.3-77.3)	53.4 (44.8-62.3)	1.5 (1.2-2.0)	0.5 (0.4-0.7)

Table 4: OSA Severity by HSAT and PSG

		PSG				HSAT Totals
		Negative	Mild	Moderate	Severe	
HSAT	Negative	39 (53.4%)	25 (34.2%)	9 (12.3%)	0	73 (35.1%)
	Mild	36 (32.4%)	45 (40.5%)	16 (14.4%)	14 (12.6%)	111 (53.4%)
	Moderate	1 (7.1%)	6 (42.9%)	4 (28.6%)	3 (21.4%)	14 (6.7%)
	Severe	0	4 (40.0%)	2 (20.0%)	4 (40.0%)	10 (4.8%)
		76 (36.5%)	80 (38.5%)	31 (14.9%)	21 (10.1%)	208
		PSG Totals				

Discussion

- Prevalence of OSA in our study (63.5%) is similar to prior studies¹⁻³ of active duty military personnel with mild OSA accounting for 38.5%
- Our study showed that HSAT lacks sufficient accuracy at the current diagnostic threshold for OSA
- As HSAT devices are primary intended for the diagnosis of moderate-to-severe OSA,⁴ this may account for the poorer diagnostic accuracy of HSAT in an active duty military population with a higher proportion of mild OSA
- Diagnostic cutoff may need to be altered in order to increase the utility of HSAT in the military
- Study Limitations**
 - Retrospective study limited to a single military hospital
 - HSAT used is the WatchPAT 200 and cannot be generalized to all HSAT modalities
 - PSG and HSAT were performed on separate nights
- Future studies** include utilizing an alternative HSAT threshold as the cutoff for the diagnosis of OSA (our clinic currently utilizes REI ≥ 15 as the cutoff)

References

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