



Compliance with Follow-up Polysomnogram in Patients Prescribed Oral Appliance Therapy for Treatment of Obstructive Sleep Apnea

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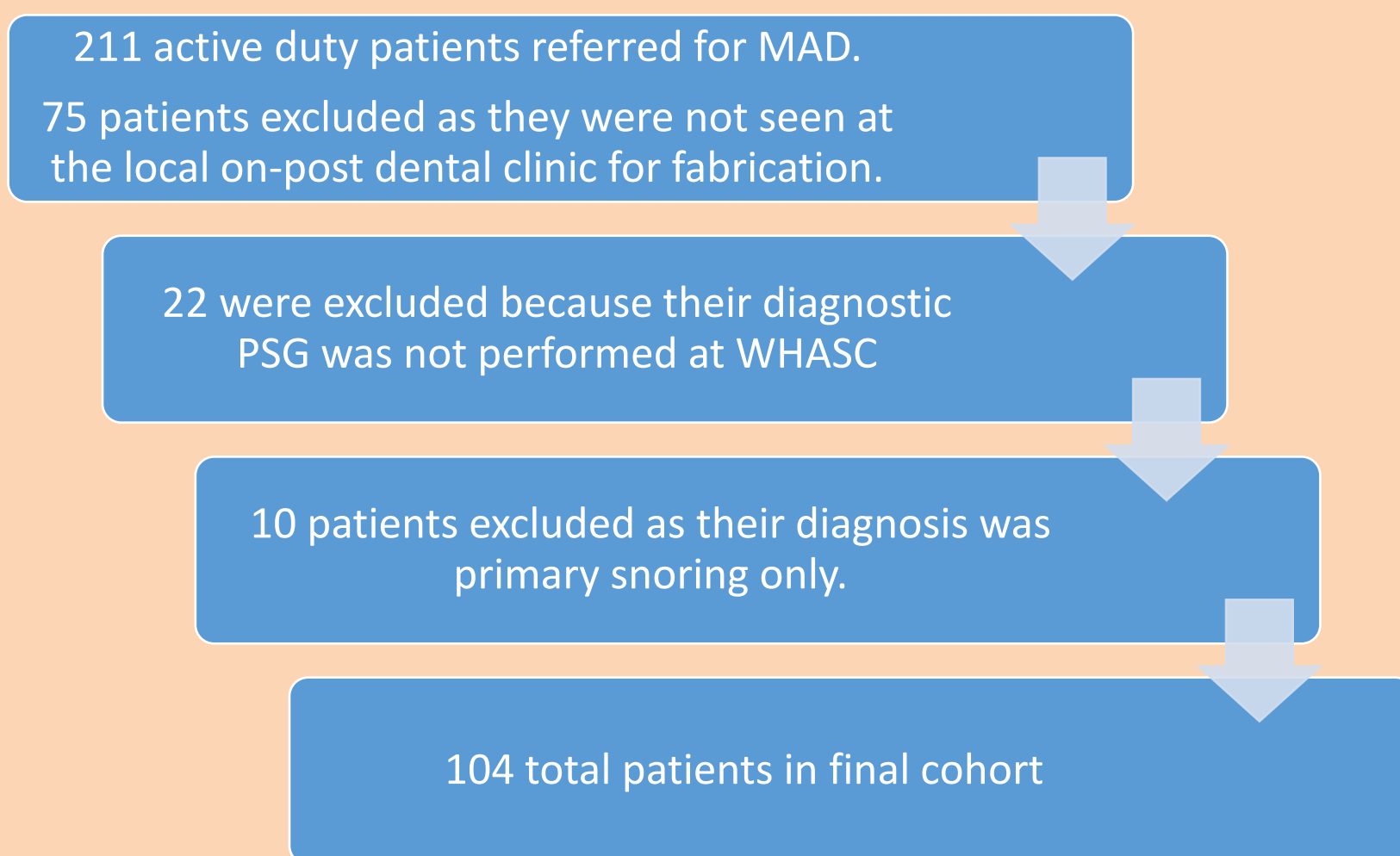
INTRODUCTION

- Oral Appliance Therapy (OAT) has been proven an effective treatment for mild-to-moderate Obstructive Sleep Apnea (OSA).
- AASM Clinical Practice Guidelines recommend follow-up sleep studies for all patients prescribed OAT to evaluate and confirm efficacy.
- The purpose of this study was to examine to what extent patients were adherent to recommendation for follow-up polysomnogram (PSG) in a single-center closed system where dental and sleep clinic communication and patient transitions are optimal.

METHODS

- Single-center study, retrospective observational chart review of charts at the sleep and dental clinics
- Eligible patients were divided into non-follow-up group and follow-up group
- Follow-up rate was determined based on availability of both diagnostic and repeat PSG data
- Demographic data, BMI, PSG data were reviewed for both groups and analyzed statistically.

Fig. Flow diagram of study selection procedure.



RESULTS

Table 1: Demographic Data From Non Follow-Up and Follow-up Groups

Demographic Factor	Non Follow up (n=90)	Follow up (n=14)	p-value
	Mean ± SD	Mean ± SD	
Age (years)	38.9 ± 9.7	38.6 ± 6.9	0.887
Male gender	74 (82%)	14 (100%)	0.025
BMI	27.7 ± 3.4	27 ± 2.4	0.332
Height (cm)	69.1 ± 3.7	69.8 ± 3.1	0.471
Weight (lbs)	188.7 ± 29.4	187.3 ± 22.1	0.833

Table 2: Diagnostic PSG Data From Non Follow-Up and Follow-Up Groups

Factor	Non Follow up (n=90)	Follow up (n=14)	p-value
	Mean ± SD	Mean ± SD	
AHI (/hr)	15.3 ± 11.8	13.8 ± 5.6	0.461
O2 Nadir (%)	88.7 ± 4.2	89 ± 4.1	0.780
Time spent with O2<88 (min)	2.2 ± 9.6	0.7 ± 1.5	0.187
TST (min)	345.2 ± 60.3	368.6 ± 37.2	0.058
Sleep Efficiency (%)	83.5 ± 11.2	87.8 ± 8	0.093
Sleep Latency (min)	11.9 ± 11.4	12.8 ± 13.6	0.827
WASO (min)	56.11 ± 45.08	38.66 ± 23.43	0.243
REM Latency (min)	121.52 ± 70.88	93.29 ± 44.13	0.195
N1 (%TST)	10.5 ± 8.0	9.2 ± 6.7	0.558
N2 (%TST)	55.3 ± 9.9	51.4 ± 8.6	0.181
N3 (%TST)	15.2 ± 8.1	15.5 ± 8.8	0.819
REM (%TST)	19.3 ± 7.3	23.9 ± 7.4	0.026

Table 3: Diagnostic PSG Data and MAD PSG Data for Follow-up Group

PSG Factor	mean Diff	95% LB	95% UB	p-val
AHI (/hr)	-3.04	1.59	-7.66	0.178
O2 nadir	-0.63	-1.44	0.18	0.297
Time spent with O2<88 (min)	0.08	2.07	-1.92	0.935
Sleep Efficiency (%)	-0.02	0.03	-0.07	0.437
Sleep Latency (min)	-4.12	4.89	-13.12	0.339
TST (min)	-23.00	-0.85	-45.15	0.043*
WASO (min)	8.88	-9.43	27.19	0.435
REM Latency (min)	-9.86	-39.84	20.13	0.670
N1 (%TST)	-0.660	-4.540	3.223	0.614
N2 (%TST)	-0.160	-5.460	5.142	0.749
N3 (%TST)	1.143	-2.980	5.269	0.787
REM (%TST)	-0.310	-5.010	4.385	0.855

DISCUSSION

- Previous studies evaluating OAT for treatment of OSA have shown:
 - overall good compliance
 - treatment efficacy when treating mild-to-moderate OSA
- In our study, compliance rate with follow-up PSG was poor (13.5%) and treatment was not effective for the follow-up group
- Possible explanations for poor follow-up:
 - Limited access to care during COVID pandemic
 - Increase rate of relocation of military population
 - Significant satisfaction with OAT
 - Significant dissatisfaction with OAT
- Inadequate treatment efficacy possibly due to low arousal threshold endotype in military population and low sample number of study group

FUTURE DIRECTIONS

- Studies are needed to assess the underlying reasons for poor patient compliance with obtaining a follow-up PSG
- Large scale studies involving more subjects in multiple military treatment facilities.

REFERENCES

- Mysliwiec V, Martin JL, Ulmer CS, et al. The Management of Chronic Insomnia Disorder and Obstructive Sleep Apnea: Synopsis of the 2019 U.S. Department of Veterans Affairs and U.S. Department of Defense Clinical Practice Guidelines. *Ann Intern Med.* 2020;172: 325-336. doi:10.7326/M19-3575
- Ramar K, Dort LC, Katz SG, Lettieri CJ, Harrod CG, Thomas SM, Chervin RD. Clinical practice guideline for the treatment of obstructive sleep apnea and snoring with oral appliance therapy: an update for 2015. *J Clin Sleep Med* 2015;11(7):773-827.
- Barnes M, McEvoy R, Banks S, et al. Efficacy of positive airway pressure and oral appliance in mild to moderate obstructive sleep apnea. *Am J Respir Crit Care Med.* 2004; 170:656-664.
- Blanco J, Zamarron C, Abeleira Pazos M, et al. Prospective evaluation of an oral appliance in the treatment of obstructive sleep apnea syndrome. *Sleep Breath.* 2005;9:20-25.
- Chan A, Cistulli P. Oral appliance treatment of obstructive sleep apnea: an update. *Curr Opin Pulm Med.* 2009;5:591-596.
- Ng JH, Yow M. Oral Appliances in the Management of Obstructive Sleep Apnea. *Sleep Med Clin.* 2019;14(1):109-118. doi:10.1016/j.jsmc.2018.10.012
- Hoffstein V. Review of oral appliances for treatment of sleep-disordered breathing. *Sleep Breath.* 2007;11(1):1-22. doi:10.1007/s11325-006-0084-8