

The Risk of Obstructive Sleep Apnea and Correlation with Cardiovascular Risk Factors in Patients with Pituitary Adenomas

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Background

- Sleep disorders and sleep disordered breathing confer higher cardiovascular risk
- 52-70% of acute myocardial infarctions and strokes, hypertension (HTN), diabetes mellitus (DM), weight gain, sleepiness, fatigue, and depression have been correlated with obstructive sleep apnea (OSA)
- OSA may compound the risk of cardiovascular disease, HTN and DM.
- Patients with pituitary adenomas (PA) often present with reported sleep dysfunction, fatigue and metabolic risk factors that may persist despite treatment

Objective

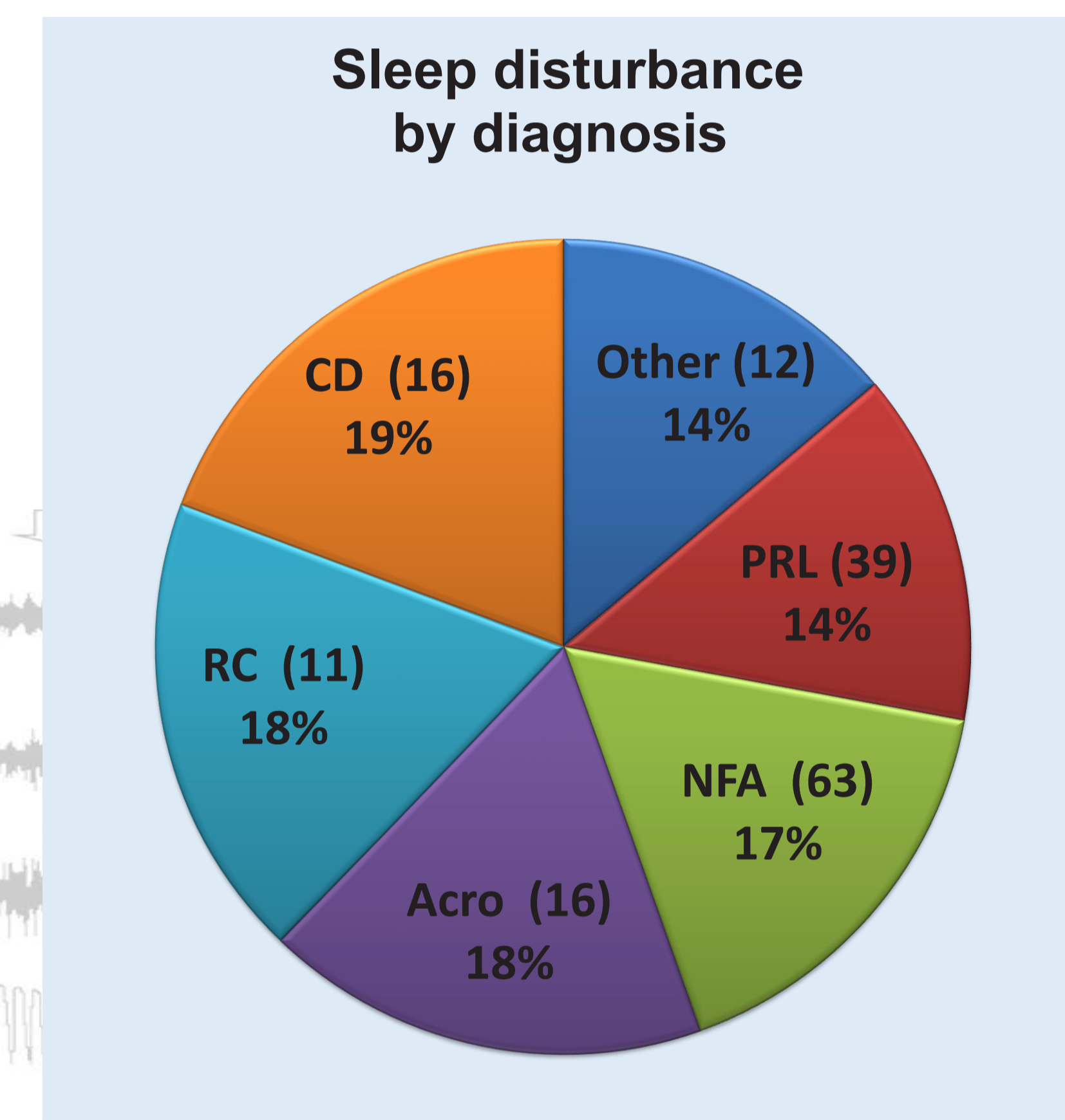
Assess any correlation between sleep disturbance (SD), depression, body mass index (BMI), HTN, DM, pituitary deficiencies, tumor size, diagnosis, and risk of OSA for patients with a PA.

Methods

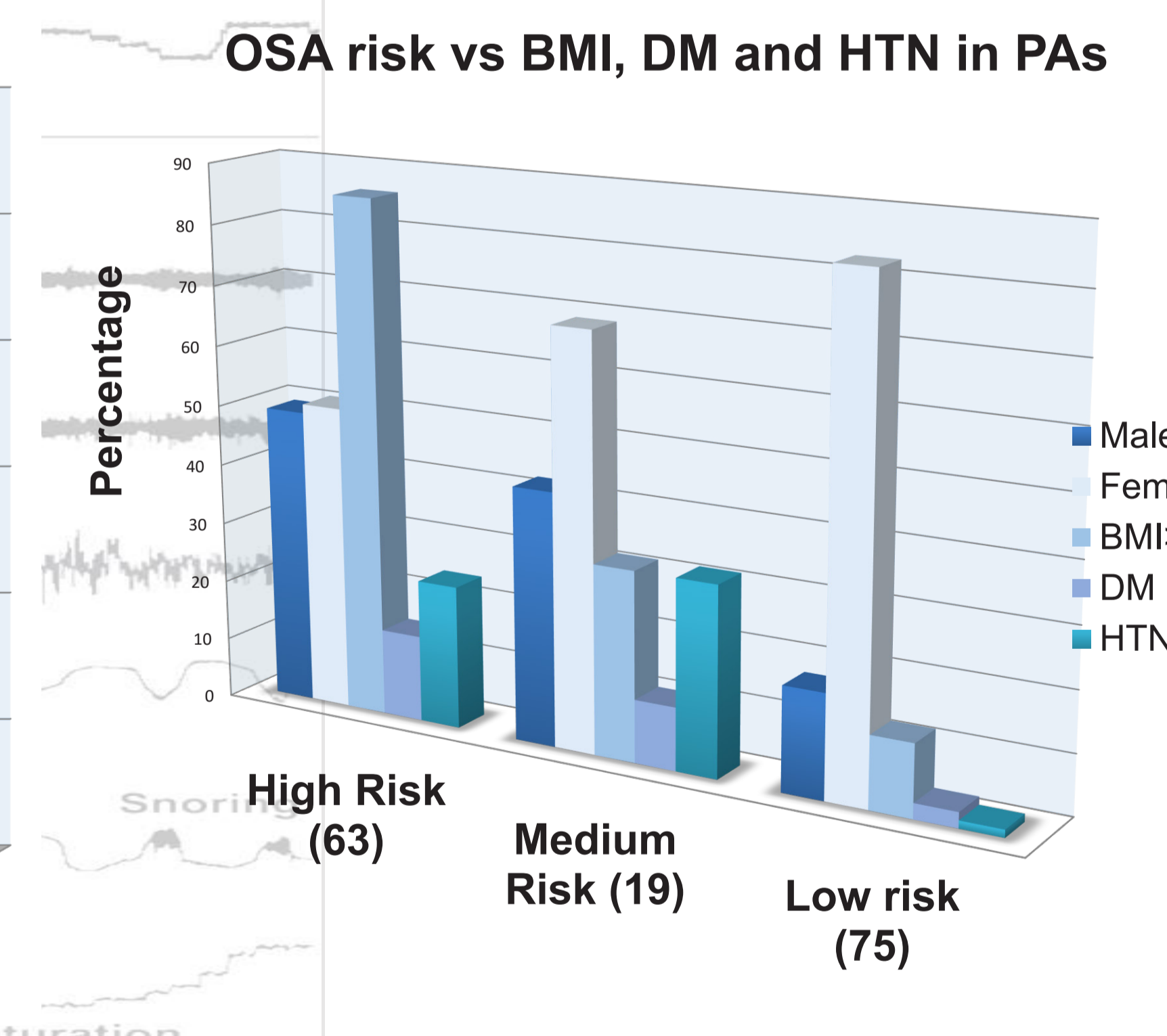
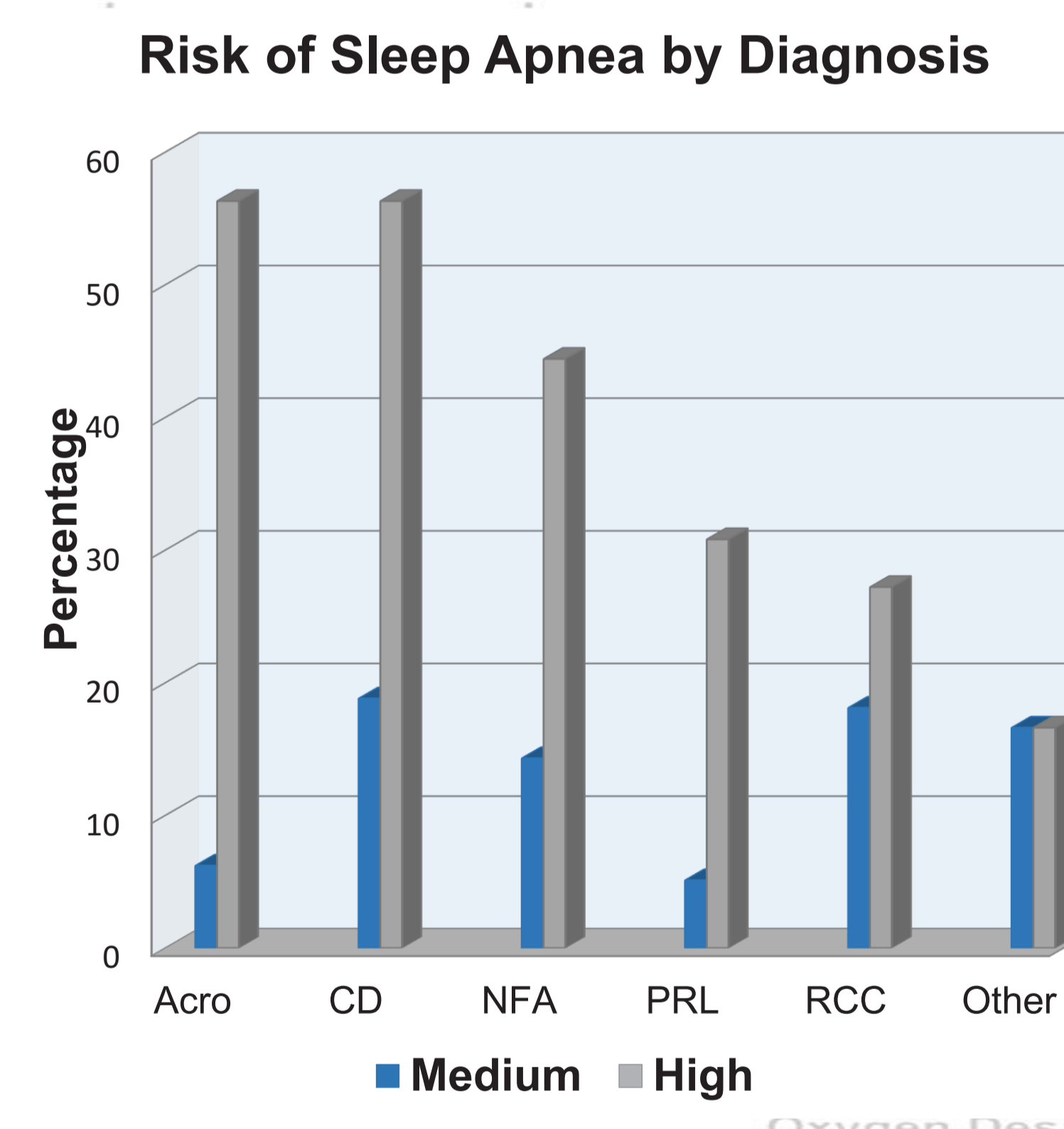
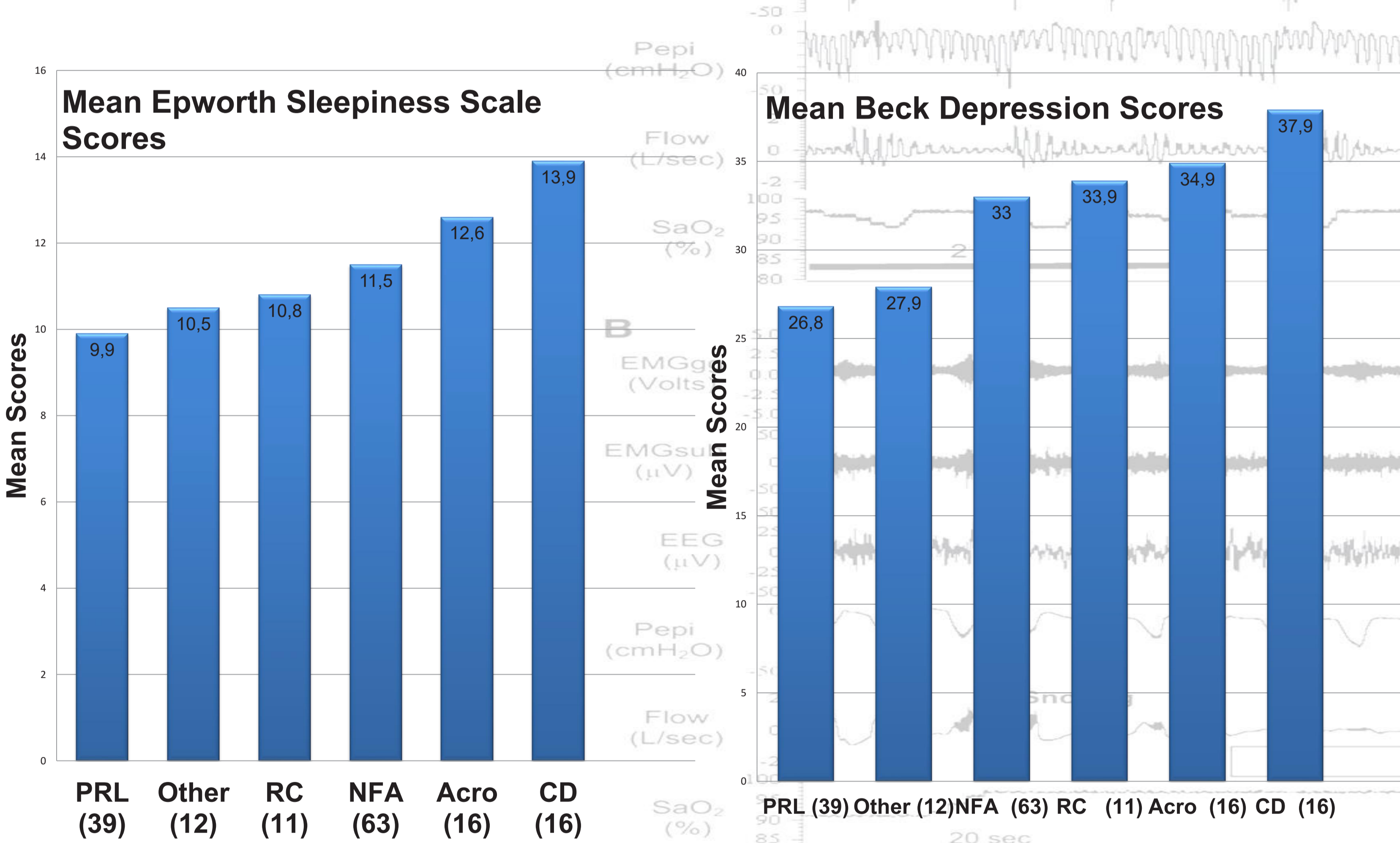
- A single institution, prospective assessment of patients presenting with a PA on magnetic resonance imaging (MRI)
- Patients with prior surgeries were excluded
- Diagnoses confirmed by biochemistry and/or histopathology
- All patient underwent standard pituitary function testing at presentation including:
 - cortrosyn stimulation test (CST); exception-Cushing's disease (CD)
 - thyroid stimulation hormone (TSH)
 - free thyroxine (free T4)
 - follicle-stimulating hormone (FSH)
 - luteinizing hormone (LH)
 - insulin-like growth factor-1 (IGF-1)
 - prolactin
 - testosterone (males)
- Further diagnostic testing as indicated for CD and acromegaly
- Baseline tumor size (by MRI)
- HTN (treated or > 8th Joint National Committee (JNC8) guidelines)
- DM (treated) or HA1c > 6.5% (7.8mmol/L)
- Assessment tools included:
 - Modified: Piper Fatigue Scale (PFS)
 - Epworth Sleepiness scale (ESS)
 - Beck Depression Inventory (BDI)
 - STOPBang Inventory was applied to stratify OSA risk
 - Statistical Analysis with PASW18.

Results

- 157 PA patients (106 female/51 male; 74 with a macroadenoma and 83 with a microadenoma) included
- Clinical depression in 36% of patients (mood disturbance 56%), SD in 64% (ESS >10, PFS >2), and pituitary deficiency in >1- 40%
- Higher SD, BMI and depression were correlated (p=0.001) as were BMI, DM and HTN (p=0.001)
- Overall SD, HTN, DM, # pituitary deficiencies, tumor size, were not correlated
- Patients with CD had more SD (p=0.01), depression (p=0.007), DM (p=0.001) and HTN (p=0.03)
- Risk of OSA in PA patients was 57% (90/157, high risk in 17%) with highest risk in presence of DM and HTN.



PA patients (n=157)	Mean age (years)	Male (n)	Female (n)	Mean BMI	BMI (% > 30)	Overall pituitary deficient (n)	DM (%)	HTN (%)
Acromegaly (Acro; n=16)	49.6	6	10	31.4	43.8	10	12.5	18.8
Cushing disease (CD; n=16)	46.4	2	14	35.9	68.8	7	31.3	43.8
Non-functioning adenoma (NFA; n=63)	47.9	26	37	30.1	47.6	46	3.2	3.2
Prolactinoma (PRL; n=39)	38.5	10	29	27.1	28.2	17	7.7	20.5
Rathke's Cleft Cyst (RC; n=11)	41.6	1	10	29.7	45.5	4	0	9.1
Other (n=12)	48.3	6	6	31.3	41.7	13	8.3	8.3



Discussion

- Patients with PAs frequently report sleep disturbance
- The risk of OSA is known to increase with BMI, age and male gender
- Here the highest risk of OSA was found in patients with CD and acromegaly with concomitant DM and HTN
- Those patients with NFA and more numerous hormonal deficiencies were also at higher risk of OSA
- Higher depression scores were associated with higher SD particularly for patients with CD, acromegaly and NFA
- Risk was equal by gender
- The influence of gender on OSA may be less prominent in the presence of a PA

Conclusion

- Sleep disturbance in patients with a PA is correlated with depression, BMI > 30kg/m² and associated with a moderate to high risk of OSA, particularly in the presence of DM and HTN
- Screening for SD at baseline and further evaluation for OSA post treatment may be warranted for patients with persistent symptoms, depression, increased BMI, HTN, and DM
- Further research into sleep dysfunction in patients with PA and the relationship to BMI, HTN and DM is indicated.

References

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