Does Anxiety affect compliance with CPAP therapy in patients with Obstructive Sleep Apnea?

Dr. Awais Zaka
Dr. Jeffery Mador, MD
TOPIC OUTLINE

- Introduction
- Study Objective
- Inclusion Criteria
- Exclusion Criteria
- Method
- Statistics
- Measurements & Results
- Conclusion
- Limitations of study
DISCLOSURES

☐ None
INTRODUCTION

- Anxiety
- OSA
- Relationship
ANXIETY DISORDER

ANXIETY DISORDER

- Pre-Modern Western Christendom: *anxietas*
- Robert Burton “The Anatomy of Melancholia”
- French “Angoisse”
- Germans “Angst”
- Spanish “Augustia”
- Sigmund Freud
- Current literature
- Over 40million adults
OSA: A HISTORIC PERSPECTIVE

- Sir William Osler “Pickwickian Syndrome”
- Burnwell et al. (1956)
- No correlation between *pickwickian syndrome* and sleep disturbance at night
- First polysomnography 1965s
- Gastaut and associates showed repeated apneas in such patients
- Collin Sullivan, June 1981 CPAP

ANXIETY & OSA

- Anxiety can range 11% to 70% in OSA patients
- Higher level of anxiety in OSA patients
- OSA Affects 2% of Men & 4% of Women
- 16.7% of Veterans with OSA have an anxiety disorder
- CPAP Treatment reduces symptoms of anxiety
- Patients diagnosed with sleep apnea were at greater odds of receiving diagnosis of anxiety disorder


GLOBAL PHENOMENON

☑ Small study (n=40)
☑ Prevalence of anxiety and depression
☑ Statistically significant difference between two groups

STUDY OBJECTIVE

To assess compliance of CPAP therapy in a veteran population with anxiety compared to matched controls without anxiety.
**INCLUSION CRITERIA**

- PSG demonstrating obstructive sleep apnea
- Diagnosis of Anxiety and on antianxiety medication
- Follow-up visits from start of CPAP therapy
  - Short term - 3 months *and/or*
  - Long term - 1 year
- Smart card data at 3 months *and/or* 1 year visits
EXCLUSION CRITERIA

- Absence of baseline PSG
- History of PTSD, schizophrenia
- Diagnosis of anxiety but not on antianxiety medication
METHODS

- Sample: All VA patients on treatment for sleep apnea between 1998 - 2011
- Case-control retrospective analysis
- Matched for BMI, AHI & Age at diagnosis
Total patients 235

EXCLUDED (69)
No PSG 9
PTSD 22
No card data 5
Loss to follow up 33

Cases 83

Controls 83
STATISTICS

- Unpaired t-test used for continuous variables
- Fisher’s test used for categorical variables
- p-value <0.02 significant
OUTCOME COMPLIANCE MEASURES

4 variables measured at visits 1 & 2

- Percent days with device usage
  - No. of days when CPAP use recorded
  - Total no. of follow-up days

- Percent days with device usage > 4 hours
  - No. of days >4 h use recorded
  - Total no. of follow-up days
OUTCOME COMPLIANCE MEASURES (Cont.)

- **Average usage - all days (in minutes)**
  - Total min. of CPAP usage
  - Total no. of follow-up days

- **Average usage - days used (in minutes)**
  - Total min. of CPAP usage
  - Total no. of days when CPAP use was recorded
MEASUREMENT AND RESULTS

1. Demographics
2. Comorbidities
3. Outcome Compliance measures at 3month
4. Outcome Compliance measures at 12months
Table-1 Characteristics of study population with OSA

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Cases (n=83)</th>
<th>Controls (n=83)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI, kg/m²</td>
<td>34.41 ± 6.21</td>
<td>34.38 ± 6.13</td>
<td>0.97</td>
</tr>
<tr>
<td>AHI/hr</td>
<td>28.92 ± 22.06</td>
<td>29.94 ± 23.79</td>
<td>0.77</td>
</tr>
<tr>
<td>AGE at diagnosis, years</td>
<td>56.87 ± 13.66</td>
<td>55.58 ± 11.60</td>
<td>0.51</td>
</tr>
<tr>
<td>ESS</td>
<td>11.58 ± 5.04</td>
<td>11.85 ± 5.05</td>
<td>0.73</td>
</tr>
</tbody>
</table>

**GENDER**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Cases</th>
<th>Controls</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEN, n(%)</td>
<td>78 (93.97%)</td>
<td>75 (90.36%)</td>
<td>0.56</td>
</tr>
<tr>
<td>WOMEN, n(%)</td>
<td>5 (6.02%)</td>
<td>8 (9.63%)</td>
<td>0.56</td>
</tr>
</tbody>
</table>

**RACE**

<table>
<thead>
<tr>
<th>Race</th>
<th>Cases</th>
<th>Controls</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAUCASIAN, n(%)</td>
<td>77 (92.77%)</td>
<td>67 (80.72%)</td>
<td>0.30</td>
</tr>
<tr>
<td>AFRICAN-AMERICAN, n(%)</td>
<td>6 (7.22%)</td>
<td>16 (19.27%)</td>
<td>0.07</td>
</tr>
</tbody>
</table>
### Table-2 Comorbidities of study population

<table>
<thead>
<tr>
<th>Comorbidities</th>
<th>Cases (n=83)</th>
<th>Controls (n=83)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>16(19.27)</td>
<td>17(20.48)</td>
<td>1.00</td>
</tr>
<tr>
<td>CAD</td>
<td>21(25.30)</td>
<td>20(24.09)</td>
<td>1.00</td>
</tr>
<tr>
<td>CHF</td>
<td>1(1.20)</td>
<td>9(1.84)</td>
<td>0.01</td>
</tr>
<tr>
<td>HTN</td>
<td>53(63.85)</td>
<td>66(79.51)</td>
<td>0.38</td>
</tr>
<tr>
<td>DM</td>
<td>27(32.53)</td>
<td>39(46.98)</td>
<td>0.40</td>
</tr>
<tr>
<td>DYSLIPIDEMIA</td>
<td>61(73.49)</td>
<td>62(74.69)</td>
<td>1.00</td>
</tr>
<tr>
<td>CVA</td>
<td>3(3.61)</td>
<td>2(2.40)</td>
<td>1.00</td>
</tr>
<tr>
<td>GERD</td>
<td>27(32.53)</td>
<td>33(39.75)</td>
<td>0.41</td>
</tr>
<tr>
<td>RHINITIS</td>
<td>9(10.84)</td>
<td>16(19.27)</td>
<td>0.19</td>
</tr>
<tr>
<td>SINUSITIS</td>
<td>2(2.40)</td>
<td>1(1.20)</td>
<td>1.00</td>
</tr>
</tbody>
</table>
### Table-3 Compliance Measures - 3 Months

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>CASES (n=62)</th>
<th>CONTROLS (n=73)</th>
<th>Difference of means</th>
<th>p-VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Days device used</td>
<td>77.44 ± 26.40</td>
<td>71.63 ± 30.02</td>
<td>5.81</td>
<td>0.23</td>
</tr>
<tr>
<td>% Days device used &gt; 4 hours</td>
<td>51.23 ± 35.13</td>
<td>43.81 ± 33.66</td>
<td>7.42</td>
<td>0.21</td>
</tr>
<tr>
<td>Average Usage - all days, minutes</td>
<td>248.92 ± 145.74</td>
<td>213.97 ± 139.14</td>
<td>34.95</td>
<td>0.15</td>
</tr>
<tr>
<td>Average Usage - days used, minutes</td>
<td>305.46 ± 127.46</td>
<td>261.60 ± 114.87</td>
<td>43.86</td>
<td>0.03</td>
</tr>
<tr>
<td>VARIABLES</td>
<td>CASES (n=63)</td>
<td>CONTROLS (n=51)</td>
<td>Difference of means</td>
<td>p-VALUE</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>--------------</td>
<td>-----------------</td>
<td>---------------------</td>
<td>---------</td>
</tr>
<tr>
<td>% Days device Used</td>
<td>79.19 ± 27.93</td>
<td>73.35 ± 31.12</td>
<td>3.84</td>
<td>0.48</td>
</tr>
<tr>
<td>% Days device used &gt; 4 hours</td>
<td>61.58 ± 33.88</td>
<td>56.95 ± 34.76</td>
<td>4.63</td>
<td>0.47</td>
</tr>
<tr>
<td>Average Usage - all days, minutes</td>
<td>286.24 ± 164.82</td>
<td>262.00 ± 153.78</td>
<td>24.24</td>
<td>0.42</td>
</tr>
<tr>
<td>Average Usage - days used, minutes</td>
<td>347.16 ± 135.90</td>
<td>314.11 ± 136.55</td>
<td>33.05</td>
<td>0.20</td>
</tr>
</tbody>
</table>
CONCLUSION

Anxiety patients on medical therapy are equally compliant with CPAP when compared with matched controls without Anxiety.
LIMITATION

Retrospective study
Population studied – predominantly male & Caucasian
PTSD & OSA

- PTSD is associated with less CPAP use
  (25.2% vs 58.3%, p= 0.01)

- Medication vs Non-medication group
  (34.6% vs 9.1)

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QUESTIONS
Thank You