Sleep Disorders
in
Primary Care

a personal view

Andrew G Veale
Abnormal Sleep

- Disorders of the initiation & maintenance of sleep (DIMS)
  - Insomnia 1\textdegree{} or 2\textdegree{} (medical / psychiatric conditions)
  - PAS
  - PDS

- Disorders of excessive sleepiness (DOES)
  - Not enough
  - Obstructive sleep apnoea
  - Narcolepsy
  - RLS/PLMS

- Abnormal behaviors during sleep (Parasomnias)
  - NREM
    - Sleep walking/talking/night terrors
  - REM
    - REM Behavior disorder
30 second System Review Questions

- How do you feel you sleep at night
- Are you sleepy or tired during the day
- What does your partner think about your sleep
- Do you snore most nights
FACTS

- It is never normal to nod off in meetings
  - Common doesn’t mean normal
- Snoring is a marker of partial airway obstruction
- Apnoea means “about to die”
- If you don’t ask, they won’t tell you!
- If symptoms develop slowly: people just change
Snoring, UARS, OSA, OHS

- The disorder is an anatomical disease
- The disease/disorder is common
- There is a continuous range of severity (BP)
- No obstruction = good, lots of obstruction = bad
- There are personal clinical impacts
- There are family impacts
- There are societal impacts
- Treatment works
- Some treatments work better than others
- Treatment has to be used to work
- Some treatment is better than no treatment
- Sometimes 2 treatments are required
Upper airway 3D anatomy in OSA
Why are we treating this person?

- To help the patient’s symptom(s)
  - Ask the patient about their problem, treat the patient, then ask the patient are they better (enough)
- To help the spouse’s / family’s problem (s)
  - Ask the spouse / family about their problem, treat the patient, then ask the spouse / family are the problems better (enough)
- To reduce the risk to society (sleepiness)
  - Assess with a surrogate which seems to reflect risk of sleepiness / car crash, treat the patient, reassess the surrogate
- To reduce the risk of cardiovascular disease (metabolic / inflammatory consequences)
  - Assess with a surrogate which seems to reflect the risk of cardiovascular disease, treat the patient and reassess the surrogate
Why do we do a test in patients with SDB?

- **Diagnosis**
  - Need to have access to a sensitive test (Rule out)

- **Screening for severe OSA / case finding**
  - Need to have access to a specific test (Rule in)

- To stratify severity

- To guide therapeutic choice

- To assess response to treatment

(Screening is a test to detect 100% of those with the disease but will also detect false positive cases. I.e. generates an enriched sample which will require further investigation)
Pathophysiology

- Abnormally narrowed airway
- Increased collapsibility
- Airway collapse – multi-level problem
  - Palate, base of tongue, pharynx, supraglottis or all levels
- Increased effort
- Sympathetic outpouring
- Desaturation
- Arousal
- Vibration damage to endothelium
Symptoms, Risk Factors

Source: Random sample of 10,000 NZ adults aged 30-60 yrs, 71% response rate
Data courtesy of Dr Ricci Harris

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4% O₂ Desaturations / Hour

- Random sample from electoral roll, 30-60 years
- 169 Maori, 195 non-Maori
- Overnight MESAM4 monitoring at home

Data courtesy of Kara Mihaere

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The iceberg of sleep disordered breathing (20% of adults at risk)

- Snoring or mild OSA (<5/hr), no symptoms; high burden of disease
- Mild to moderate OSA, no symptoms: accelerated CV disease? – high burden of disease
- Symptomatic OSA: tolerate treatment
- Bad OSA

Relative numbers of affected individuals

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Hint
Correlation between Sleep Study indices (AHI) and symptoms (ESS), both patient and partner.

Kingshott et al Thorax 1995;50:994

103 OSA patients and their wives. Differences between patient and partner assessment but neither correlated with AHI.
Berlin questionnaire (arose out of a conference in Berlin in 1996)

Netzer et al, Ann Int Med 1999;131:485
Based on questions (snoring, sleepiness etc), risk factors (age, weight sex, neck etc) and presence of hypertension.

744/1008 questionnaires returned (Cleveland, Ohio)
100 portable sleep studies (Eden Tec, threshold RDI > 5/hr)

37.5% classified as high risk (n=279)

If placed in High risk
31%>15/hr, 86%>5/hr

If placed in Low risk
3%>15/hr, 23%<5/hr (false –ves)

Overall prevalences very high!
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Tsai et al (Remmers, Flemons) AJRCCM 2003;167:1427-32

A decision rule for diagnostic testing on OSA.

75 patients referred to a predominantly OSA service

RDI cut off of 10 chosen, 48% had OSA

Age, snoring, witnessed apnoeas, hypertension

Physical examination:-

BMI, neck circumference, mandibular protrusion, thyro-rami distance, sterno-mental distance, thyro-mental displacement, crico-mental space, pharyngeal grade, palatal position, tonsillar size and overbite.
Typical symptoms & oximetry
The role of oximetry

Evidence?
- Misses at least one third of OSA patients (Douglas et al, Lancet 2002);
- Underestimates RDI by 48% (Jobin et al, Thorax 2007)

Pitfalls?
- ill general medical patients are often sleepy due to their illness and if they snore in the ward then oximetry may mislead as many reasons to desaturate e.g. COPD.
- desaturation reflects many variables in addition to length of apnoea;
- repetitive apnoeas are seen in CHF (40% of CHF patients with ejection fraction <40% will have periodic breathing);
Embletta Partial Study: Respiratory Variables only

Detects:
• Oximetry
• Respiratory effort
• Flow
• Position
• Movement
• ECG
Full Polysomnography: Gold standard

- Its use is partially historical accident;
- No test has been shown to be better therefore it is gold standard by default;
- It is not a perfect test and has limitations:
  - Inability to detect micro-arousals reliably
  - R & K scoring is a crude tool (20 sec epochs)
  - Significance of flow limitation
Whitelaw et al, Calgary, Canada (AJRCCM 2005;171:188-93)

- 308 pts with ?OSA randomised to PSG or home oximetry
- Seen in clinic and probability of responding to CPAP estimated

1 = <25%, 2 = 25-50%
3 = 50-75%, 4 = >75%

Response to CPAP assessed by change in SAQLI

Was PSG superior to oximetry?
NO DIFFERENCE

Pale = PSG    Dark = Oximetry
F&P HC600
F&P Interfaces
Who complies with CPAP therapy long term?

- Significant daytime sleepiness – ESS >10/24;
- Those who have sought treatment voluntarily!
- Those with severe OSA;

McArdle et al, AJRCCM 1999;159:1108

ESS>10

ESS<10

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Why are we under pressure to Ix?


- Untreated OSA associated with dramatic increase in CVS events both fatal and non-fatal;
- CPAP treatment appears to reduce the risk to near normal;
- Not randomised, observational study
Mandibular Advancement (lateral CBCT)

Neutral

Advanced
Somnodontics Appliances
Harm vs. Severity
Test selection (Medico-legal)

- 45 yr old truck driver
  - Referred because of observed sleepiness on job.
  - ESS 2/24
  - Partial sleep study  Oxygen desaturation 2/Hr
  - Returned to driving
  - Killed a family of 5 Two weeks later

- DID NOT SLEEP on study night
Test Selection – Co-morbid conditions

- 62 year QC
- ESS 17/24
- RDI 45
- Intolerant to CPAP (Autoset)
- EF 22%
- PSG Complex CSA
- Fine on Servo Ventilator

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Test Selection (Other sleep disorder)

- 45 year old professional
- Heavy snorer occasional witnessed apnoeas
- ODI 3
- Trial of CPAP advised
- No benefit
- Self referred for opinion
- Narcolepsy
What are we treating?

- 55 yr old Chinese man – BMI 23
- Heavy snorer witnessed apnoea
- RDI 69: min saturation 72%
- CPAP trial great
- Wanted surgery
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- Tucker Woodson transpalatal advancement
- Snoring no sleepiness wife nearly happy
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- 55 yr old Chinese man – BMI 23
- Heavy snorer witnessed apnoea
- RDI 69: min saturation 72%
- CPAP trial great
- Wanted surgery
- Tucker Woodson transpalatal advancement
- Snoring no sleepiness wife nearly happy
- RDI 40: min Saturation 75%
- Tongue coblation
- No snoring no sleepiness wife happy
What are we treating?

- 55 yr old Chinese man – BMI 23
- Heavy snorer witnessed apnoea
- RDI 69: min saturation 72%
- CPAP trial great
- Wanted surgery
- Tucker Woodson transpalatal advancement
- Snoring no sleepiness wife nearly happy
- RDI 40: min Saturation 75%
- Tongue coblation
- No snoring no sleepiness wife happy
- RDI 37: min saturation 78%

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GP

History & Examination

H/O nasal obstruction, hayfever
(treat NCS)

Anatomical Nasal or tonsillar Obstruction

Yes

Severity Assessment Test

No

H/O nasal obstruction, hayfever
(treat NCS)

Refer

High pretest probability

Low pretest probability or comorbidity or 2 sleep disorders or medico-legal

NP

Simple Test

CR study

ODI < 20

Not confirmed

Oximetry

ODI > 20

Confirmed

Trial of CPAP

Specialty Clinic

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Specialist Clinic

Medico-legal
Comorbidity
2 sleep disorders
Failed other tests

Probable OSA
CardioResp Test

not confirmed
confirmed

PSG

Trial of CPAP

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CPAP

Bad Co-morbidities

- CSA or OHS
- Manual Titration

No Comorbidities

- Autoset
  - then / or
  - Single Pressure CPAP
    - Not tolerated
      - ENT
      - Dental
        - (Patient pref)
    - Tolerated but problems
      - ENT referral to optimise airway
    - Tolerated well
      - GP FU
      - Sleep Service Access

Sleep Service FU

FU Sleep Study