

Sleep Medicine

DR ANTONIO AMBROGETTI
50 SMITH ST CHARLESTOWN 2290 NSW
PH:02-49422457 FAX:02-49478128
www.sleepmedicine.com.au

Central Apnoeas

Central sleep apnoea is defined as absence of airflow without respiratory effort. Central sleep apnoea is not a uniform syndrome and there is more than one type (see below). Central apnoea in its pure form is reasonably rare but a combination of obstructive sleep apnoea and central apnoea is much more frequent. Even more frequent is “mixed sleep apnoea”. This refers to an episode of apnoea, which starts as central type (no respiratory effort at the beginning) but toward the end of the episode it tends to become obstructive in nature, see fig1 below.

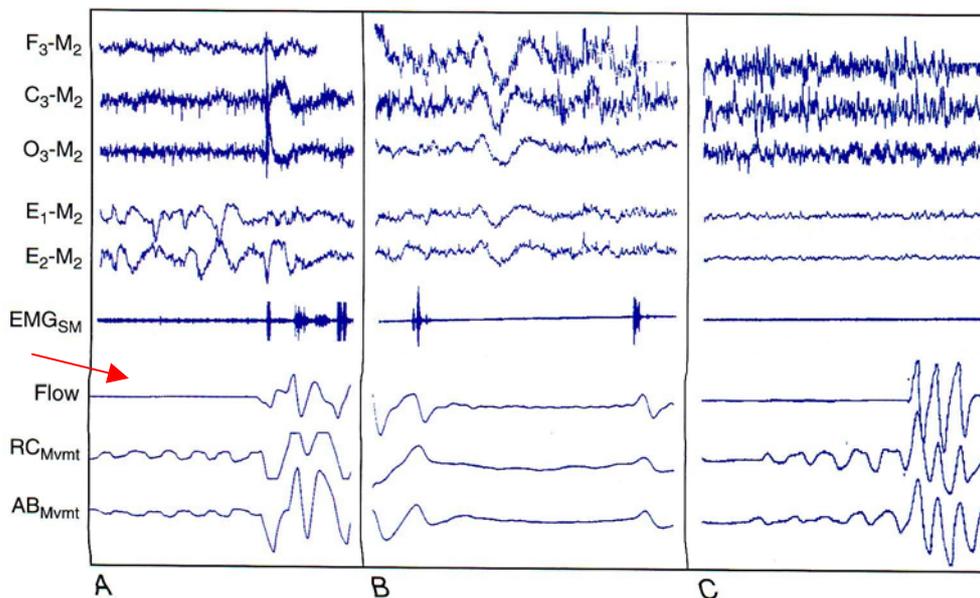


Fig1 “A” (Obstructive sleep apnea): there is no flow (arrow), but rib cage (RC) and abdominal (AB) are contracting. “B” (central apnea): no flow and no RC and no AB movement. “C” (mixed apnea): no flow and no movement in the first half and then RC and AB effort begins in the second half.

The **clinical implication** of central apnoea is that in the pure form it is usually not responsive to CPAP. In the mixed apnoea sometimes, once the obstructive component

is controlled by CPAP, central episodes become more numerous and more evident, because the obstructive apneas do not mask the many central apneas.

Three main types of central apnoea can be identified in adults.

1. Cheyne-Stokes central apnoea figure 2
2. Periodic breathing figure 3
3. Ataxic breathing (Biot's breathing) figure 3

Cheyne-Stokes breathing has a well familiar pattern often associated with heart failure and sometimes previous strokes. It is common in heart failure with a prevalence reported as high as 25-40%. In strokes it is said to be 10% of cases. There is a male predominance.

The best approach to treatment is by optimization of heart function. If this is not sufficient the use of an Auto server ventilator, which has a special algorithm to stabilize the oscillating breathing pattern, appears to be quite affective. In individuals in whom the auto server ventilation is not effective the use of oxygen may be beneficial.

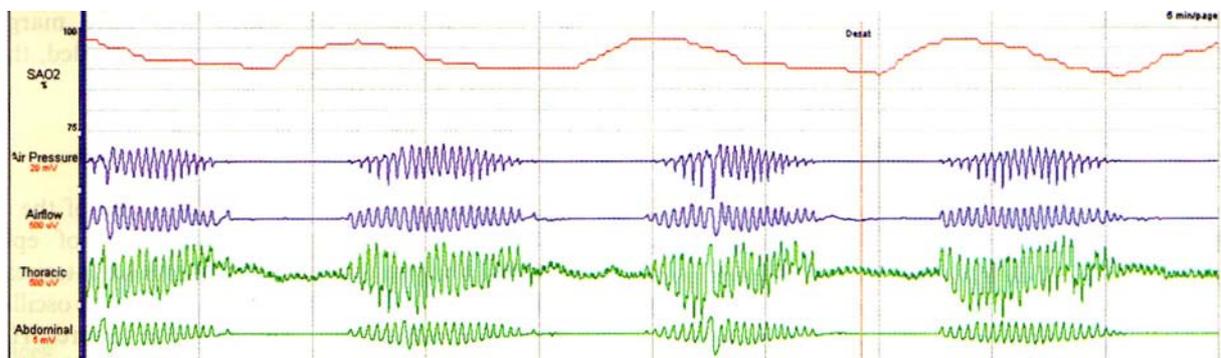
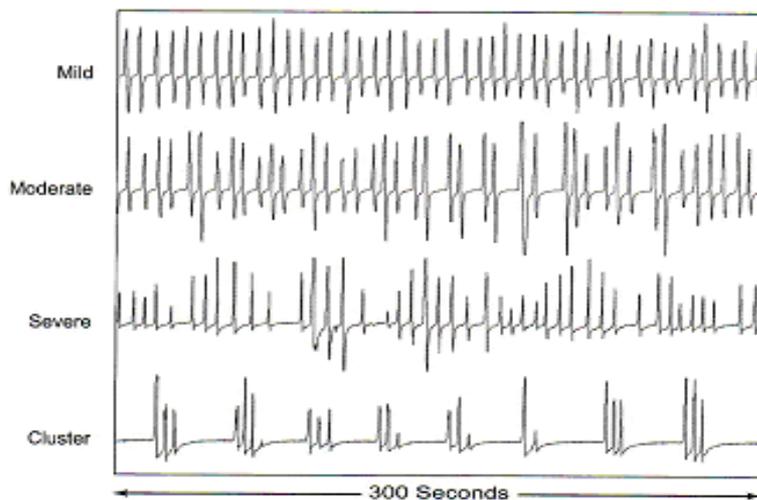


Fig 2 Note how Airflow, thoracic and abdominal activity have a crescendo-decrescendo pattern

Central apnoea associated with opioids. It was recognized that people who chronically use opioids could have periodic breathing. This can be a combination of Biot's breathing pattern (ataxic breathing) as well as periodic breathing as such. In the methadone clinic a prevalence of central apnea of up to 30% has been reported. A typical example is in figure 4 on the next page. In this case the breathing is central

apnoea, quite irregular in keeping with ataxic breathing (Biot's breathing). The central apnoea associated with long term opioids use may or may not be symptomatic depending on the number of arousals associated with it and oxygen desaturation.



Variations of "Biot's Breathing". Air flow patterns obtained from PTAF signals showing varying degrees of ataxic or irregular breathing (mild, moderate and severe) plus an example of "cluster breathing" obtained from patients in this series who were chronically receiving opioid medications. Note the marked variability of V_T and frequency in the moderate and severe categories.

Fig 3 Strictly speaking ataxic breathing (Biot's breathing) as originally described is similar to the "severe" example. The "cluster" type, what we refer to as "period" breathing (regular recurrent cluster of breaths) is more commonly seen in idiopathic form and in opioids users.

"Periodic breathing" like in figure 4, is not uncommonly seen in young people and in adults and may be totally asymptomatic and in no need of treatment.

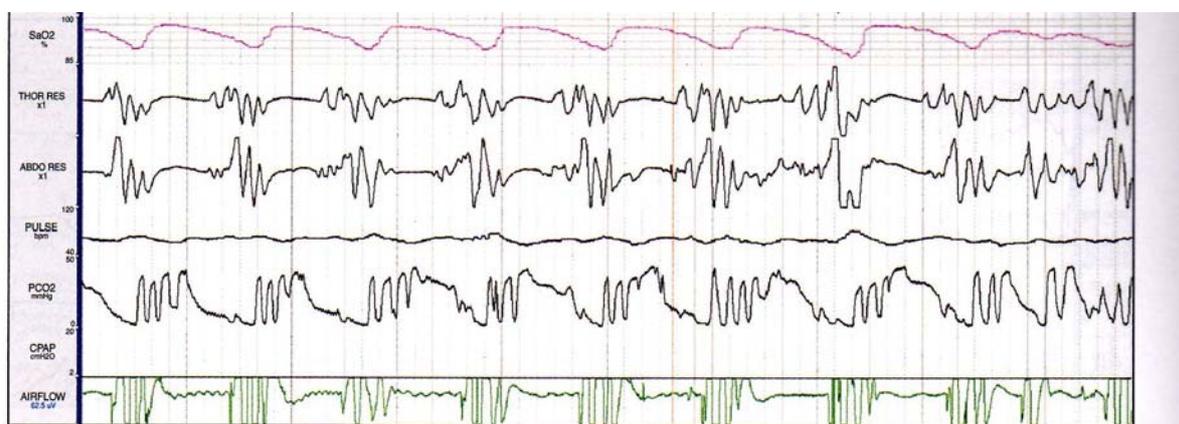


Fig 4 In periodic breathing (contrary to ataxic breathing) there is a regular recurrent pattern (arrow). There is also no crescendo-decrescendo pattern, like in Cheyne-Stokes breathing.

An important implication in terms of diagnosis is that screening test including oximetry often failed to recognize central apnoea. A full polysomnography both for diagnosis and titration is needed in these cases.

My staff and I take this opportunity to wish a Merry Christmas to you, your family and staff and a healthy 2010.

Antonio Ambrogetti

16-12-09

Ref:

Atlas of sleep Medicine Kryger 2009

Javarheri et al J Cli Sleep Med ,vol 4, 2008