Thorax

Editorials

Is sleep disordered breathing associated with increased mortality?

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There is a continuum in sleep disordered breathing (SDB) from chronic snoring to upper airway resistance syndrome to obstructive sleep apnoea (OSA) that is associated with progressively increasing consequences. The reported prevalence of SDB depends on the recognition threshold. In a landmark community based study, Young and coworkers[1] found that 2% of women and 4% of men had both daytime sleepiness and an apnoea-hypopnoea index (AHI) of >5/hour. In this month's *Thorax* Knuistingh Neven and colleagues[2] present data from a small Dutch town which suggest that the prevalence of OSA with associated daytime sleepiness is at least 0.9% in men of 35 years or older. Thus, SDB is common, but how clinically significant is it? In their provocative systematic review Wright *et al*[3] concluded that there is limited evidence of increased mortality or morbidity in patients with OSA. To put these conclusions in context, it needs to be recognised that our understanding of SDB has only recently moved from its infancy to its adolescence. We are only at a similar stage in our knowledge of the natural history of SDB to where we were with systemic hypertension and hypercholesterolaemia several decades ago.

There are limited data on the mortality associated with SDB. In a prospective study of 1620 middle aged patients in Israel, age, body mass index, hypertension, and apnoea index were all shown to be independent predictors of deaths.[4] In retrospective studies Partinen and colleagues[5] reported decreased five year survival in patients with untreated OSA compared with both patients treated by tracheostomy and the US age adjusted survival curve. He and coworkers[6] demonstrated a decreased survival in patients with untreated OSA with an apnoea index of >20/hour. This difference was most evident in patients below 50 years of age. The major cause of increased mortality in SDB appears to be cardiovascular in nature.[7] However, Gonzalez-Rothi and associates[8] found no difference in mortality between treated and untreated patients with OSA and a group of control patients. Unfortunately the controls were not well matched for sex, weight, and the presence of comorbidity. In elderly patients the effect of SDB on long term survival is less clear. Ancoli-Israel and colleagues[9] showed an association between OSA and decreased survival in elderly women but not in men. Bliwise and coworkers[10] found no difference in mortality in a group of treated and untreated elderly patients with OSA compared with control subjects. Furthermore, a four year follow up of non-demented retired old people found that the respiratory disturbance index was not a predictor of mortality.[11]

In this issue of *Thorax* Lindberg and colleagues[12] provide additional prospective data on the mortality associated with snoring and daytime sleepiness, the two hallmark symptoms of SDB. In a 10 year follow up of 3100 men 213 died and 88 of these deaths were due to cardiovascular disease. Snoring without excessive daytime sleepiness was not associated with an increased mortality rate. However, the combination of snoring and excessive daytime sleepiness was associated with an increased mortality rate, but the effects were age dependent. The increased mortality was in part explained by an association between snoring and excessive daytime sleepiness and cardiovascular disease. This study also provides interesting information about the non-cardiovascular consequences of SDB. There were three suicides in the 295 men aged 30–59 years with both snoring and excessive daytime sleepiness and only two suicides in the 2253 men without these symptoms. This highlights the potential importance of the psychiatric consequences of SDB. Sleep disturbances are a common feature of psychiatric disease, usually presenting as disorders of initiating and maintaining sleep. SDB can also present with psychiatric disease such as depression[13] and psychosis[14] which then improve with effective treatment.[15 16] SDB may coexist with psychiatric illness, and recognition of this will lead to appropriate treatment.

Patients with SDB are more prone to automobile accidents. The most recent study concerning this association examined the five year driving records of 913 participants in the Wisconsin Sleep Cohort Study.[17] When they controlled for age, sex, miles driven/year, alcohol use, and education they found that chronic snorers with an AHI of >5/hour were 1.4 times more likely to have had at least one accident in the previous five years. Patients with an AHI of >15/hour were 7.3 times more likely to have had multiple accidents. Untreated patients with OSA can have serious automobile accidents which result in death or serious injury.[18] However, in the 213 deaths in the study by Lindberg and colleagues[12] only five were because of accidents and none was thought to be related to daytime sleepiness.

SDB causes episodic asphyxia and sleep fragmentation which result in many protean multisystem consequences. The immediate consequences have been extensively studied, but the long term consequences are not well established. In the next few years the Sleep Heart Health Study probably represents the best opportunity to provide new data on the long term consequences of SDB. This is a multicentre cohort study sponsored by the United States National Heart, Lung and Blood Institute to assess SDB as an independent or contributing risk factor for the development of

cardiovascular and cerebrovascular disease. This study utilises existing cardiovascular cohorts and will examine whether SDB is associated with an increased risk of incident coronary heart disease events, incident stroke, increase in blood pressure, and increased risk of all cause mortality.

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