

Respiratory events during sleep Amiens: 19th-20th November, 1987

N.J. Douglas

This meeting under the joint chairmanship of Professors Levi-Valensi and Duron covered many aspects of breathing during sleep, including normal physiology, the sleep apnoea/hypopnoea syndrome, breathing during sleep in patients with chronic obstructive pulmonary disease and nocturnal asthma. The programme was a composite of review lectures and original papers liberally interspersed with discussion, which was often heated. The full proceedings will be published by INSERM this year.

Sleep apnoea/hypopnoea syndrome

Dr J.H. Peter (Marburg) presented data indicating that in an unselected working population in an electrical power company, 10% of the employees (9 of 95) had more than ten apnoeas per hour of sleep [1]. These nine subjects tended to have more medical problems than the rest of the population, including hypertension, obesity, hyperlipidaemia and psychological disorders. This prevalence of 10% is a much higher level than reported in other studies, which have mainly indicated a level of around 1% [2-4] but there is a relative lack of large population studies.

There was considerable debate on the extent of monitoring required when investigating patients suspected of having the sleep apnoea/hypopnoea syndrome. Professor Kurtz (Strasbourg) argued the case for the use of full polysomnography with the minimum of electroencephalogram, electro-oculogram and electromyogram, flow and volume sensors and oximetry to investigate such patients. This approach allows accurate quantitation of abnormal breathing, of the extent and frequency of desaturation, and of sleep disruption, all of which are important in the assessment of patients with the sleep apnoea/hypopnoea syndrome. Such monitoring also allows assessment of whether sleep disruption may have occurred for other reasons, for example nocturnal myoclonus, and may help to indicate other pathologies. Polysomnography also provides proof that the patient slept - one reason for getting a falsely normal result by simplified screening techniques.

Much debate centred on whether oximetry alone

should be adopted as the initial investigation but many felt that the value of this technique had not yet been fully assessed. Preliminary data from North America [5], quoted at the meeting, suggested that with oximetry alone the correct diagnosis can be made in two-thirds of patients but that it can lead to over-diagnosis of the sleep apnoea/hypopnoea syndrome in around 7% of patients, in whom an alternative and clinically more important diagnosis would have been made by polysomnography. Nine percent of the 30% with normal oximetry were found, on polysomnography, to have non-respiratory causes for their symptoms. It was the impression of the meeting that these results would be confirmed elsewhere. Thus, the role of oximetry alone will depend on local practice and to some extent on whether individuals are prepared to treat patients with severe forms of the sleep apnoea syndrome, with for example continuous positive airway pressure therapy, without first performing full polysomnography. If they are prepared to do this, then many patients with moderate or severe sleep apnoea/hypopnoea syndrome may not require polysomnography. If, on the other hand, all patients with abnormal oximetry are to be referred for full polysomnography then oximetry alone will not prevent any polysomnography, as all patients with symptoms but normal or mildly abnormal oximetry will also require polysomnography to try to identify another cause for their symptoms.

There were several papers and posters examining automated or semi-automated analysis of respiratory variables during sleep. Many were concerned with the use of oximetry alone. The oximetry data was satisfactorily handled by some of the computer systems and some programs also seemed to be obtaining adequate results on respiratory pattern analyses. However, there remained a divergence of views as to definitions of abnormal breathing patterns and what index of oxygen saturation should be used to assess the normality of overnight oxygen saturation traces.

Clinical aspects of the sleep apnoea/hypopnoea syndrome

The papers on this topic included a dramatic video from Palermo of three patients having apnoea-associated convulsions when severely hypoxaemic. An investigation of the association of the sleep apnoea

Dr N.J. Douglas, Senior lecturer in medicine and respiratory medicine, Dept of respiratory medicine, University of Edinburgh, Edinburgh, U.K.

syndrome with nocturia showed that patients with the sleep apnoea/hypopnoea syndrome had greater salt and water excretion at night than normal subjects. Continuous positive airway pressure (CPAP) therapy corrected these abnormalities. These results have since been confirmed by others [6]. There were also several small series or case reports of the association of the sleep apnoea/hypopnoea syndrome with various neurological or endocrinological abnormalities, and on the cardiovascular complications of the sleep apnoea/hypopnoea syndrome. A study of computerized tomography scanning during obstructive apnoeas confirmed that the site of obstruction was at the level of the pharynx and that there was no excess fat visible around the upper airway [7].

Treatment for patients with the sleep apnoea/hypopnoea syndrome.

Surgical treatment options were reviewed by Dr C. Guilleminault. In this area many hold strong opinions, but these are not based on convincing published data. Thus, one of the main benefits from this Congress will be publication of the details of investigation, treatment and outcome on patients treated surgically in Stanford. Cephalometry by lateral X-ray was held to be as useful as computerized tomography or magnetic resonance imaging scans in assessing upper airway calibre and bony structure. However, cephalometry had to be very carefully performed with standardized techniques. Combined mandibular and maxillary osteotomies for jaw advancement were the most successful surgical approach when used in rigorously selected patients. The advantages of surgical correction over nightly therapy for life with CPAP or drugs were stressed, particularly for young or middle-aged patients. The role of uvulopalatopharyngoplasty was discussed and further amplified by poster presentations, in which partial but incomplete improvement of symptoms and nocturnal breathing patterns were observed following the procedure.

The role of nasal continuous positive airway pressure therapy was summarized by Dr J. Krieger (Strasbourg). This treatment is now widely used in Europe, North America and Australasia and abolishes symptoms, apnoea related hypoxaemia, arrhythmias and other complications. The importance of achieving adequate patient motivation was stressed, as was the need for a comfortable, quiet, low resistance system. Compliance rates of over 80% were being obtained, which is comparable to figures published elsewhere [8].

The role of drug treatment was reviewed by Dr J. Block (Gainesville), concluding that protriptyline was probably the most useful drug to treat the obstructive sleep apnoea/hypopnoea syndrome. Progesterone could be useful in patients who had progressed to the Pickwickian syndrome, oxygen could occasionally be beneficial and acetazolamide

was useful in the apnoeas associated with altitude. The harmful effects of alcohol and sedative drugs were stressed.

REM hypoxaemia in patients with chronic obstructive pulmonary disease

The mechanisms and consequences were reviewed by Professor D.C. Flenley (Edinburgh). Areas covered included the prediction of which patients would desaturate at night and to what extent. The clinical significance of the co-existence of chronic obstructive pulmonary disease or other hypoxic lung diseases with the sleep apnoea/hypopnoea syndrome was discussed. Dr H. Matthys (Freiburg) summarized the haemodynamic changes which occur in patients with chronic obstructive pulmonary disease during sleep and the benefits of oxygen therapy.

There were other papers and posters presented on various aspects of breathing during sleep in patients with chronic obstructive pulmonary disease. Several posters documented that almitrine improved oxygenation and decreased carbon dioxide retention at night in patients with chronic obstructive pulmonary disease. These effects occur both when the patients breathe air and when they breathe supplemental oxygen. Three studies on the new sedative drug zopiclone showed that it had relatively little effect on breathing during sleep in patients with chronic obstructive pulmonary disease in the dosage studied.

The possible causes of the circadian changes in airway calibre in nocturnal asthma

The possible causes were reviewed by Dr N.J. Douglas (Edinburgh). The role of sleep in synchronizing changes in bronchial tone, possibly by controlling alterations in autonomic nervous activity, was discussed. The deleterious effects of asthma on sleep quality and possibly on daytime performance were mentioned. The potentially harmful effects of theophylline on sleep quality in patients with nocturnal asthma were reviewed. Other presentations on nocturnal asthma included confirmation that sleep was disturbed in patients with nocturnal asthma, comparison of β -agonists and theophyllines in the treatment of nocturnal asthma and studies showing that the duration of wheeze during sleep stages was proportional to the time spent in that stage.

Conclusion

The meeting gave a good overview of the problems of breathing during sleep in patients with a wide variety of medical conditions. Many areas of dissent were highlighted and areas requiring further investigation identified. Indeed, the meeting should be judged a success in that so many

unanswered questions were raised which hopefully will stimulate further research.

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