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Follow-up of conservatively treated sleep apnoea patients

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Polysomnograms have been recorded at our laboratory since 1985 for the diagnosis of sleep apnoea. Until the recent availability of continuous positive airway pressure devices in Johannesburg, it appeared that some of our subjects were receiving only conservative or no treatment. Structured interviews were conducted with 63 patients with positive polysomnographic findings of sleep apnoea/hypopnoea (SAH), and, where possible, with sleeping partners. Information was obtained about the patients' understanding of the diagnosis by the referring doctor, the recommended treatment and psychosocial consequences. The primary reason for the initial consultation was excessive daytime sleepiness (43%). Diagnoses following polysomnography included SAH (65%) and narcolepsy (6%), while 10% were told they had nothing to be concerned about. Some form of treatment was recommended to 80% of patients, usually weight loss (60%) or medication (59%). Psychosocial consequences

were prominent and included a perception of reduced work capacity (62%) and compromised safety (56%). At the time of the interview 90% of patients were experiencing one or more symptoms associated with SAH. These findings support the serious nature of SAH and confirm the need for adequate treatment centres in South Africa.

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Sleep apnoea is the cessation of, or a more than 90% decrease in, baseline airflow at the nose or mouth for a period of 10 seconds or longer. Sleep hypopnoea involves a more than 50% but less than 90% decrease in airflow associated with awakening, signs of EEG arousal or a more than 3% decrease in oxyhaemoglobin saturation determined by oximetry.¹ There is a lack of uniformity in the number of these events per sleep period which constitutes a condition of clinical significance. Criteria of 5 events per hour of sleep or 10 events per hour have been applied.² When these repetitive disruptions of breathing during sleep are associated with one or more symptoms such as excessive daytime somnolence, loud snoring, unsatisfying nocturnal sleep, disrupted sleep or secondary polycythemia, this condition is referred to as the sleep apnoea/hypopnoea syndrome (SAHS).³ However, many other symptoms may be reported.

Diagnostic problems are common and, even in severe cases, diagnosis may be delayed for years because the patient's daytime symptoms are highlighted. SAHS is frequently missed as a result of diffuse symptoms, and patients tend to be referred to a series of different specialists.⁴ Even clinicians with experience in sleep disorders may only be able to predict sleep apnoea in 50% of patients suspected of having this disorder when relying on clinical features such as history, physical examination and subjective impressions.⁵ A laboratory test, the polysomnogram, frequently provides vital diagnostic information, including the type and severity of SAH, and the findings may have therapeutic implications.⁶

Several different approaches to treatment have been advocated. Weight loss and other behavioural strategies, continuous positive airway pressure (CPAP) therapy and surgery are the most common for obstructive SAH.⁶ In central SAH, which is much less prevalent than obstructive SAH, medication is the most common form of treatment but usually has limited efficacy.⁷

SAHS is relatively common, occurring in approximately 1 - 8% of adult males.⁸⁻¹⁰ The condition occurs much less frequently in women.¹¹

Our unit has offered a polysomnographic service since 1985. From informal, occasional contact with patients we gained the impression that either conservative or no treatment may have been a typical approach. CPAP therapy has only recently become available in Johannesburg and was not used by our patients.

This study sought to obtain information on the effects of treatment on SAHS and the progression of symptoms in patients likely to be receiving conservative treatment. Previous studies of this kind are rare and African studies have not been reported.

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Material and methods

Structured telephonic interviews were conducted with 63 patients whose polysomnographic findings were indicative of SAH. Where possible, information was also obtained from spouses, who were the sole source of information in the case of the 7 patients who were deceased at the time of the interview.

Polysomnographic recordings commenced between 13h00 and 14h00 and lasted for 2 - 3 hours. The majority of patients were regarded as having sleep apnoea if they experienced five or more periods of apnoea per hour of non-rapid eye movement sleep, each period exceeding 10 seconds in duration. Only latterly was sleep hypopnoea³ taken into account. Oxygen saturation levels were monitored by pulse oximetry in a minority of the latter subjects.

Polysomnographic findings indicated that 27% of subjects had obstructive SAH, 25% had central and 48% had mixed SAH. The use of afternoon polysomnographic recordings probably identified subjects at the severe end of the SAHS spectrum and is likely to have exaggerated the incidence of central SAH.

There were 57 men and 6 women, aged 28 - 69 years (mean 49 years). The period between diagnostic test and interview was 1 month to 7 years (mean 1.9 years). There were 62 white subjects and 1 Asian. The mean body mass index¹² was 34 (range 18 - 78). The occupations of patients covered a broad spectrum from manual worker to highly qualified professional.

The interview requested information on: (i) the main reasons for consulting the doctor who then requested the polysomnogram; (ii) perception of the diagnosis by the referring doctor; (iii) details of treatment instituted by the referring doctor and its effectiveness; (iv) the time-course of symptoms related to SAHS and their presence at the time of the interview; (v) additional medical problems possibly related to SAHS; and (vi) the psychosocial effects of SAHS, including those related to work and safety and family relationships. Responses were coded for analysis by computer.

Results

Of the 7 deceased patients, 1 had died during sleep; narcolepsy had been given as the cause on the death certificate. Another died of a heart attack, 1 as a result of complications following gastric stapling, 1 from cancer and 2 from unknown causes, according to their spouses.

Almost half (48%) of the patients were referred for polysomnography by neurologists, 25% by specialist physicians and the remainder by other specialists including otolaryngologists and psychiatrists. Only 2 patients were referred by general practitioners.

The main reasons for seeking medical treatment are summarised in Table I. Excessive daytime sleepiness was most frequently mentioned (43%). Diverse medical problems such as hypertension and asthma were predominant in 24% of patients. Only 6% of patients suspected a sleep-related breathing problem, usually as a result of observations by the sleeping partner.

Table I. Primary reason given by patients for consulting the doctor who recommended the polysomnographic test

Reason	No.	%
Daytime sleepiness	27	43
Insomnia	5	8
Narcolepsy	2	3
Excessive snoring	3	5
Obesity	2	3
Suspected sleep apnoea	4	6
Uncertain	5	8
Other reasons (e.g. asthma)	15	24

Following the positive polysomnographic findings of SAH, patients claimed that they were given the following diagnosis: 65% sleep apnoea, 6% narcolepsy, 2% a dysfunction of a gland in the brain; 10% were told that they had no medical problem to be concerned about. No diagnosis was given to 18%, but they were referred to another doctor.

Treatments recommended to the patients are summarised in Table II. Most frequently advocated was weight loss (60% of the group). Of these patients 71% claimed to have managed to lose weight at some stage and just over half of these patients felt that they had experienced some alleviation of their symptoms as a result. Notwithstanding this, 67% of patients exceeded 130% of their ideal weight at the time of the interview and only 9% were within 10% of their ideal weight. Seven patients exceeded 200% of their ideal weight. Of our patients who reported having succeeded in losing weight, the amount lost varied from 5 kg to 76 kg with a mean of 20 kg.

Table II. Patients' reports regarding treatment(s) recommended by the referring doctor (%)

Treatment	Group	Complying	Benefiting
Weight reduction	60	71	59
Medication	59	100	30
Change of sleep position	16	77	57
Surgery	13	54	17
No treatment	20		

A change in sleeping position, usually to avoid sleeping on the back, was recommended to 16% of patients. This was attempted by 77% of these patients and 57% of them claimed that it had helped to a noticeable degree.

Some form of surgery was recommended to 13 patients (24%). Six patients refused, 2 patients underwent gastric stapling for severe obesity and 4 had operations to the throat. Only 1 patient claimed to have benefited from the surgery.

While 59% of patients reported that their referring doctors had prescribed medication, these details tended to be vague. Thirty per cent reported that they had been prescribed a stimulant, 10% a hypnotic and 3% antidepressants. The majority of these patients (60%) claimed to have derived no benefit from the medication.

Following diagnosis, 38% of patients revisited their referring doctor, 33% sought no further medical advice and 29% changed doctors. The reasons for seeking further

treatment were diverse and in only 25% of these patients were the reasons apparently directly related to SAHS.

From the time of the polysomnogram, 40% of patients thought their symptoms related to SAH had remained unchanged, 26% noted a slight improvement, 18% a definite improvement, 5% a slight deterioration and 11% a definite deterioration (Table III).

Table III. Patients' views on the course of symptoms following the polysomnographic test (N = 62)

Symptoms	No.	%
Remained the same	25	40
Slight improvement	16	26
Marked improvement	11	18
Slight deterioration	3	5
Marked deterioration	7	11

Symptoms typically associated with SAHS at the time of the interview are summarised in Table IV. Altogether 90% of the patients were experiencing one or more symptoms of SAHS.

Table IV. Typical symptoms of SAH reported by patients to be present at the time of the interview (N = 63)

Symptom	No.	%
Daytime sleepiness	47	77
Snoring	50	81
Disturbed nocturnal sleep	32	53
Obesity	47	74
Morning headaches	19	31
Swollen ankles	30	49
Hypertension	29	46
Pulmonary dysfunction	11	18

Almost half the patients (46%) were aware of being hypertensive, and 6% had experienced a stroke during the period between the polysomnogram and the interview.

Negative effects on work performance were claimed by 62% of patients and 56% had experienced compromised safety, particularly when driving a motor vehicle.

Negative effects on general social relationships were reported by 64% of patients and specifically within the family by 41%.

Discussion

An important finding of this study relates to the limited efficacy of the conservative treatment of SAHS. Only 16% of patients reported a definite improvement in symptoms, but at the time of the interview 90% were still experiencing symptoms that could be related to SAHS.

Daytime sleepiness was being experienced by 77%. This symptom is recognised as detrimental to the well-being of the patient, it reduces work efficiency and it increases the likelihood of traffic accidents. Daytime sleepiness is important in the context of increasing demands on efficiency and maintained vigilance in the work situation and in the commonly encountered increased traffic volumes.¹³

A number of our patients specifically mentioned having experienced motor vehicle accidents and, in some cases, multiple accidents. Falling asleep while driving is a common experience in SAHS.

There seems to be a widespread opinion that appreciable weight loss is difficult for patients with SAHS to achieve and maintain. There were, however, a few successful patients who claimed marked beneficial effects. Nevertheless, obesity was a prominent feature in our group of SAHS patients. At the time of assessment 67% were more than 130% of their ideal weight and this despite attempts at weight loss by a substantial proportion of patients. This is comparable with the 69% in a Scottish group at the time of diagnosis and before the commencement of treatment.¹⁴

The small number of patients undergoing surgery does not permit any assessment of its effectiveness. Of 13 patients who were advised to undergo gastric stapling or throat surgery, 6 refused. Clearly, surgery is an option for some patients and a tracheostomy may be necessary in severe cases of obstructive SAH.⁷

Potential difficulties in the diagnosis of SAHS without the aid of a polysomnogram are evident in the finding that only approximately half of the patients mentioned one or more of the typical symptoms of SAHS as their main reason for seeking medical assistance. Only 6% of patients suspected a sleep-related breathing disorder. The suspicion of SAHS appeared to emerge during the history-taking by the doctor and led to the request for a polysomnogram.

Following positive polysomnographic findings of SAHS, 65% of patients reported that they understood their diagnosis to include a sleep-related breathing disorder. However, many patients expressed dissatisfaction with a perceived lack of interest in their condition and tended to consult several specialists. Despite positive polysomnographic findings, 10% of patients claimed to have been told that their condition was not a cause for concern and did not require further attention.

While little is currently known about long-term morbidity and mortality in obstructive SAH,¹⁵ the importance of effective treatment is supported by previous studies.^{16,17} After a 7-year follow-up, 12% of conservatively treated patients, who had received a weight-loss recommendation only, had suffered either myocardial infarction or stroke. In a comparable group in terms of age, body mass index and apnoea index, but on whom tracheostomies had been performed, only 3% had experienced one of these. Mortality rates at 11-year follow-up showed distinct benefits for the tracheostomised group. Another study reported no significant differences in survival between tracheostomised patients with obstructive SAH and normal controls over 5- and 10-year periods.¹⁸ This is further evidence that active treatment decreases cardiovascular mortality.¹⁰

Our patients often reported declining work performance. While daytime sleepiness is a likely factor, the effects of nocturnal hypoxaemia on brain function might be another factor. There is evidence of possible irreversible cognitive decline in some cases of severe SAHS.¹⁹

There seems to be little doubt that specialised centres, which offer diagnostic and treatment services to patients with SAHS, are needed. Failure to provide this service prolongs exposure to a potentially debilitating condition and perpetuates a highly dangerous situation while the patient is

driving a motor vehicle. In addition, patients with this potentially reversible condition often perform poorly in the work situation and experience negative changes to family relationships. A failure to treat this condition is likely to have major medical and social consequences.

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