EFFECTS OF LORAZEPAM ON OXYGEN SATURATION BEFORE CARDIAC SURGERY

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SUMMARY

We have studied patients presenting for coronary artery bypass surgery on two nights before surgery. Oxygen saturation during a night when the patient received no night sedation was compared with the night before surgery, when lorazepam 3-4 mg was given. There was no difference between the two nights when the total time at oxygen saturations less than 90% were compared, but the minimum oxygen saturation value when the patient received lorazepam was significantly smaller. No patient had significant sleep apnoea. (Br. J. Anaesth. 1993; 70: 219–220)

KEY WORDS


Angina and hypertension have been reported to occur in patients with sleep apnoea syndrome [1]. Patients presenting for coronary artery bypass surgery have angina and often have treated hypertension. Benzodiazepines are often prescribed, but these drugs are known to worsen pre-existing oxygen desaturation [2]. The aim of the present study was to compare the oxygen saturation and frequency of apnoea during a night when the patient received no sedation, with the night before bypass surgery when lorazepam was prescribed.

METHODS AND RESULTS

Informed consent was obtained from 17 male patients (age range 48–63 yr; weight range 64.5–83.7 kg) undergoing elective coronary bypass surgery. Patients who had significant respiratory disease were excluded. An oximeter (Biox 3700, Ohmeda) finger probe was attached to the patient before sleep and the output connected to an Atari computer, during a night when the patient received no sedation.

The oxygen saturation and heart rate were recorded to disc by a program which recorded oxygen saturation values every 3 min, unless the value decreased by more than 5%, from the baseline, when data were recorded every 10 s until the patient awoke in the morning.

The patients received lorazepam 3 or 4 mg on the night before surgery and a second night's recording was obtained. The results were analysed to determine the percentage of the time spent at oxygen saturation values greater and less than 90%. The baseline oxygen saturation and the minimum oxygen saturation recorded were compared between the two nights. Data from the unsedated (normal) night and the sedated night were analysed using Student's paired t tests and Spearman's rank correlation test as appropriate.

Two patients were excluded from the results: one had unsatisfactory recordings caused by probe failure and the second had pulsus bigemini and a heart rate of less than 45 beat min⁻¹ which gave inaccurate oxygen saturations.

Of the remaining 15 patients, six gave a history of treated hypertension and nine had a previous infarct. No patient gave a history of sleep apnoea; four patients did not snore and one patient was a severe snorer.

The oxygen saturation results (table I) were analysed to determine the percentage of time spent at oxygen saturations greater and less than 90%. During the sedation night, there was no difference in the total percentage time that the patients spent at oxygen saturation greater than 90%, compared with the non-sedated night. Two patients had oxygen saturations less than 90% for lengthy periods: one improved his oxygen saturation during the lorazepam night, while the other had smaller values. The mean minimum oxygen recorded value during the sedation night was significantly less than the non-sedated night (P < 0.05). Ten patients decreased their minimum value, three remained at the same value and one patient recorded a greater minimum oxygen saturation.

| Table I. Mean (SD) percentage of the total time spent at oxygen saturation ($S_{pl}$) greater or less than 90% and the minimum $S_{pl}$ recorded. *P < 0.017 compared with normal night |
|---------------------------------|----------------|----------------|
| Time (%) spent at               |                |                |
| $S_{pl}$ > 90%                  | $S_{pl}$ < 90% | Min. $S_{pl}$  |
| Normal night                    | 95.0 (6.5)     | 4.9 (6.9)      | 87.3 (5.2) |
| Sedated night                   | 93.9 (14.4)    | 6.0 (14.4)     | 83.5 (6.0)* |

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No patient had significant sleep apnoea (defined as more than five oxygen saturation decreases, lasting 10 s or more in 1 h, the oxygen saturation decrease being 5% or more from the patient’s baseline oxygen saturation).

COMMENT

Patients who suffer hypertension have been shown to have an increase in sleep apnoea [3], while habitual snoring, a symptom of sleep apnoea, has been associated with angina, hypertension and ischaemic heart disease [1, 4]. In these patients, the ensuing oxygen desaturation from sleep apnoea may contribute to myocardial ischaemia [5]. Obstructive sleep apnoea, the most common type of sleep apnoea, has an increased frequency in males and in the age range 40–60 yr. These ages are similar to those of patients presenting for coronary artery bypass.

We found no patient with sleep apnoea, possibly because several of the patients developed angina after a myocardial infarction, rather than having a long history of progressing angina culminating in the need for coronary artery bypass. Hypertension in other patients was discovered at the time of infarction and may or may not have been present before the infarction. Coronary artery disease is multifactorial and the part that sleep apnoea plays in hypertension and angina remains to be determined.

A premedication regimen of lorazepam, morphine and droperidol in CABG patients has been found to decrease oxygen saturation [6] and to be associated with new ECG changes indicating further ischaemia in some patients. In the present study, lorazepam did not worsen the overall oxygen saturation during the sedation night, although one patient who had severe snoring, had a decreased oxygen saturation. In patients with a history of heavy snoring, this may indicate decreased oxygen saturation values and the need for added oxygen if benzodiazepines are prescribed.

In this study, the minimum oxygen saturation values were reduced significantly compared with the values recorded during the sedation night. It has been recommended that oxygen supplementation be given to cardiac patients premedicated with an opioid and this regimen may be recommended also for patients who receive benzodiazepines.

REFERENCES