Pre- and Post-Operative Respiratory Assessment of Acromegalics with Sleep Apnea — Bedside Oximetric Study for Transsphenoidal Approach

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Abstract. Purpose Although routine mechanical nasal packing after transsphenoidal surgery (TS) is thought to increase respiratory disorders during sleep, there has been little in the literature about the pre-and post-operative airway assessment of acromegalics with sleep apnea. We describe 4 acromegalic patients with SA, who underwent transsphenoidal surgery. Methods and cases The patients were all men, aged from 47 to 59 years. The pre-and post-operative sleep study consisted with a computer calculated oximetry parameter of oxygen desaturation index (ODI), which was defined as the number/hour of oxygen desaturation episodes exceeding 4% from the base line (normal range < 15). The postoperative (postop.) sleep study was carried out from the 1st postop. day to the 8th day, for 1 to 8 days, varying for each patient. Results Only the worst postop. result is shown. Patient 1 had 2 operations, 2 years apart. ODI was 39.6 before the 1st operation and 45.9 postop.. In the second operation ODI was 21.8 preoperatively (preop.) and 57.9 postop.. Preop. and postop. ODI was 18.1 and 22.2 in patient 2, 21.6 and 22.5 in patient 3 and 45.5 and 18.9 in patient 4, respectively. ODI of patient 4 was 39.6, 3 weeks later. Conclusion Our data showed that the postop. oxymetric study commonly showed worse results in acromegalics with nasal packing. The better result of patient 4 was probably due to a postop. sleepless state. REM sleep usually increases in the first several postop. days, when cardiopulmonary complications are more likely to occur. Since acromegalics with severe SA and postop. nasal packing may more readily suffer from cardiopulmonary complications, postoperative meticulous respiratory monitoring and care should be mandatory.

Key words: growth hormone, sleep apnea, acromegaly, sleep study

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all had typical acromegalic features and clinical symptoms suggesting SA had been present for years before surgery. The pre-and post-operative sleep study included computer calculated oximetry parameters such as oxygen desaturation index (ODI), which was defined as the number/hour of oxygen desaturation episodes exceeding 4% from the base line (normal range < 15), percent of time spent at O_2 (SaO^2) < 90%, the mean nadir of SaO2 and the lowest SaO2 (Fig. 1). The pre-and post-operative sleep study was carried out from the 1st postoperative day to the 8th day, for 1 to 8 days, varying for each patient.

Results (Fig. 2)

Patient 1 had two operations, 2 years apart. ODI was 39.6 before the 1st operation and ranged from 40 to 45.9 postoperatively. In the 2nd operation ODI was 21.8 preoperatively and 22.5 to 57.9 postoperatively. In patient 2 ODI was 18.1 preoperatively and 22.2 on the 2nd postoperative day. Patient 3 had 21.6 as a preoperative ODI. Postoperatively it ranged from 7.8 to 22.5. Improvement was noted in the latter days. Patient 4 had ODIs as 45.5 preoperatively and 18.8 and 18.7 on the 2nd and 3rd postoperative day, respectively. ODI of patient 43 weeks later was 39.6, which was close to the preoperative result. In summary, except for patient 4, postoperative ODIs showed worse results in various degrees during nasal packing. The parameters other than the ODI corresponded well to the results of ODI.

Discussion

Definition of sleep apnea

The currently accepted definition of SA is that apnea and hypopnea events at least 30 apneic episodes/night, each lasting a minimum 10 seconds. The definition was proposed by Guilleminault et al. by using polysomnography, in 1978 [2, 3]. The cost and inconvenience of the polysomnography, however, have made an alternative diagnostic method desirable. The oximeter has become an accepted substitute for polysomnography [2, 4]. In this new method, the most important parameter is oxygen desaturation index (ODI), defined as the number/hour of oxygen desaturation episodes exceeding 4% from the base line. The ODI > 15 times/hour or more makes the SA likely to be present [2].

SA and acromegaly

Increased mortality of acromegals is believed to be mainly due to high prevalence of cardiovascular, metabolic and respiratory complications such as...
hypertension, diabetes mellitus and SA [1, 5]. SA is common in acromegalic patients and its prevalence is estimated to be 17–60% in all acromegalic patients [1, 5, 6]. Untreated SA becomes an aggravating factor of systemic conditions such as hypertension and arrhythmia [5]. Therefore effect and outcome of treatment for sleep disorder has a critical influence on overall mortality and morbidity rates in acromegalics.

The etiology of SDB in acromegaly is central, obstructive or mixed. Grunstein reported that the incidence of SA of central origin is 34% in 53 acromegalic patients by using polysomnography [5]. Obstructive causes are macroglossia, soft tissue swelling or pharyngeal narrowing unrelated to tongue. Multiple factors seem to be involved to produce SA in acromegaly.

**Interpretation of results**

Various factors such as surgical stress and anesthesia are involved in interpreting pre-and postoperative oxymetric studies. However, oximetric study reveals one aspect of overall systemic and respiratory conditions and provides clinically useful information for managing acromegalic patients with nasal plug.

Our data showed that the postoperative oxymetric study did not always show worse results in acromegals with nasal packing. Since no EEG monitoring to confirm sleep length during the study was performed, the better result of patient 4 was probably due to a postoperative sleepless state. The postoperative respiratory conditions were the same or worse on 4 occasions in the remaining 3 patients. Furthermore, REM sleep usually increases in the first several postoperative days and cardiopulmonary
complications are more likely to occur during the REM sleep periods [7]. Based on these observations, acromegals with severe SA and postoperative nasal packing may more readily suffer from cardiopulmonary complications. Accordingly, pre-and postoperative meticulous respiratory monitoring and care for acromegals with SA should be mandatory.

References