Postanesthetic Hypoxemia and Oxygen Administration

To the Editor—The results and conclusions recently described by Moller et al. largely confirm our findings regarding hypoxemia in the early postoperative period. Among the similarities between these two studies are the number of patients studied (200), the high incidence of postoperative hypoxemia observed, the relationship of hypoxemia to age and type of anesthesia, and the lack of relationship between hypoxemia and other factors such as preexisting pulmonary disease or obesity.

An important point of disagreement between the two studies, however, is in the effect of oxygen therapy to prevent postoperative hypoxemia. Fifty-five percent of the hypoxicemic episodes (arterial oxygen saturation [SpO₂] ≤ 90%) Moller et al. observed in 32% of their patients occurred when patients were receiving oxygen. By contrast, fewer than 2% of patients in our study were hypoxicemic when they were receiving oxygen on arrival at the recovery room as well as 1 h later. Although we performed single measurements of SpO₂ after 10 min of oxygen therapy, while Moller et al. monitored SpO₂ continuously, we do not believe this to be the cause of such a discrepancy in the incidence of hypoxemia during oxygen therapy.

The difference may lie in the way in which oxygen was administered. The patients of Moller et al. received at least 3 l/min nasal oxygen, and depending on the presence of hypoxemia, they might have had the oxygen flow increased. Eight percent of the hypoxicemic episodes occurred because of accidental interruption of oxygen administration. In our study, we administered oxygen with a 35% Venturi mask. It is widely recognized that the inspired concentration of oxygen varies greatly when the gas is given through nasal catheter. This variation in oxygen concentration is related to inspiratory flow rate, tidal volume, and inspiratory to expiratory times ratio. An increase in all of these parameters decreases inspired oxygen concentration. The early postoperative period is characterized by variations in breathing pattern due to residual effects of anesthetics and neuromuscular blocking agents, pain, and stimulation of respiration by the staff while patients are regaining consciousness and resuming spontaneous ventilation. Each of these factors affects breathing in different ways which, in turn, increase or decrease the inspired concentration of a fixed flow of oxygen.

For these reasons, we think that in the postoperative period a fixed oxygen concentration device is more advisable to ensure a stable concentration of inspired oxygen. The disagreement between the two studies seems to favor our belief. In any case, further research is necessary to prove the relative efficiency of the different devices for administering oxygen during the early postoperative period.

JAUME CANET, M.D.
MONTSERRAT RICOS, M.D.
FERNANDO VIDAL, M.D.
Servei d’Anestesiologia i Reanimació
Hospital Universitari “ Germans Trias i Pujol”
Badalona, 08916 Barcelona, Spain

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(Accepted for publication March 8, 1991.)