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Inhalation of NO and PGI_2 Reply

Accepted: 19 April 2000

Sir: We thank Drs. Booke and Hinder for their interest in our recently published article and their comments regarding some aspects of our study [1]. They emphasize our finding that inhalation of nitric oxide (NO) resulted in a decrease in the mean pulmonary arterial pressure (MPAP) back to values observed during ventilation with an F_iO_2 of 1.0, while aerosolized prostacyclin (PGI_2) did not, and conclude that the two drugs do not seem to be equipotent. However, the potency of both drugs to improve elevated MPAP may better be described by comparing values achieved during administration of the vasodilators with those obtained during hypoxic ventilation (F_iO_2 of 0.1) without NO or PGI_2 inhalation. In this regard, administration of all doses of NO resulted in a decrease of MPAP from 30 ± 7 mmHg to 21 ± 4 mmHg, and PGI_2 reduced the elevated mean pulmonary arterial pressure from 29 ± 5 mmHg to 21 ± 4 mmHg (all values are mean ± SD) without any statistical difference between drugs. Therefore, we still consider the effectivity of NO and PGI_2 to be equal in our investigation, although we agree with Drs. Booke and Hinder that our study design does not allow a sufficient fit of actually equipotent doses of NO and prostacyclin.

Regarding the suitability of the clinical administration of NO or PGI_2, it may be true that ventilators with an integrated application and monitoring system for NO are rare; however, this does not make them less suitable. According to recent information by the distributors, the price for an upgrade of a regular ventilator offering the option for NO application is about 10,000 to 12,500 Euro, equaling approximately 70–90 single doses of 500 μg PGI_2. Therefore, costs and user suitability may not always be the reasons why technically licensed systems for NO inhalation are not widespread, but simply the small number of patients who may profit from selective vasodilator therapy. However, it may be questionable whether this can justify the modification of a regular nebulization chamber which has not been developed for the continuous administration of PGI_2.

It is certainly true that aerosolization of PGI_2 and other prostaglandins has been shown to be beneficial in different settings of pulmonary hypertension and an impaired ventilation–perfusion distribution. Likewise, inhalation of nitric oxide has been found to improve MPAP and oxygenation in patients with acute respiratory distress syndrome, although with no impact on survival [2, 3]. Therefore, it may not only be a question of which vasodilator is easier to apply, but also what the indications for such a treatment might be. In conclusion, as outlined in our article, we agree with Drs. Booke and Hinder that aerosolization of prostaglandins may be an alternative to inhaled NO. However, we cannot support their conclusion that it is technically simpler to administer PGI_2, considering the existing systems for NO inhalation and the difficulties of working with an unlicensed technology for PGI_2 without effective control of dosage.

References

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