Airway anaesthesia and breathing pattern during exercise

We read with interest the paper of Van Meerhaeghe et al. [4] on the effect of local anaesthesia of the airways on breathing pattern during exercise in normal subjects and in patients with chronic airflow obstruction. Several points of their study merit further comment, with regard to their findings in normal subjects.

No differences were found in pulmonary function tests before and after aerosolization of lidocaine, results similar to those we obtained in normal subjects [1] using bupivacaine aerosol. However, their negative results on exercise are in contrast to those we reported where airway anaesthesia resulted in slower deeper breathing for a given oxygen consumption [5]. Though this difference was probably not due to differences in the quality of airway anaesthesia obtained in the two studies, it cannot be attributed as the authors state (p. 384) to differences in methods of measurement of ventilation on exercise. In both studies a mouth-piece and nose-clip were used; we only used respiratory inductance plethysmography to assess ventilation at rest. The major difference, however, as the authors note, was in the exercise protocol used and in particular our use of maximal incremental exercise. Previous work [2] has demonstrated the presence of a Hering-Breuer inflation reflex in man at inflation volumes greater than 1 litre above functional residual capacity and thus the effects of airway anaesthesia might be more evident at larger tidal volumes on maximal exercise.

In their interesting discussion the authors consider that their negative results might be attributable to failure to block a drive to breathe mediated by unmyelinated vagal fibres from J-receptors located at alveolar level. Using a local anaesthetic aerosol of similar particle size, we have shown that it is possible to block the effects of central intravenous injections of capsaicin (thought to selectively stimulate unmyelinated fibres) in both animals [3] and man [6].


References