Title: EVALUATION OF ANTI-HYPOXEMIC MANEUVERS BEFORE TRACHEAL ASPIRATION IN MECHANICALLY VENTILATED NEWBORNS

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OBJECTIVE. Periodical tracheal aspiration in mechanically ventilated patients is necessary to remove mucus from airways. In children and adults this procedure causes transient hypoxemia, which may be prevented by hyperoxia and/or hyperventilation. These findings, however, have not been sufficiently assessed in newborns. Thus, we investigated the usefulness of hyperoxia and/or hyperventilation as anti-hypoxemic maneuvers before tracheal aspiration in neonates.

DESIGN. Prospective, randomized, multiple crossover study.

SETTING. NICU of a third-level pediatric hospital located in Mexico city.

PATIENTS: Fifteen newborns under mechanical ventilation.

Interventions: Within a 12 h period every patient received in random order three anti-hypoxemic maneuvers during 1 min just before tracheal aspiration: hyperoxia (10% increase of baseline FiO2), hyperventilation (50% increase of ventilator cycling rate) and both. Additionally, a control (sham) maneuver was also applied.

MEASUREMENT. Pulse oximeter saturation (SpO2) was recorded before and after each anti-hypoxemic maneuver, and at 0, 15, 30, 60 and 300 s after tracheal aspiration.

MAIN RESULTS: Basal values of SpO2 (81.5±1.5%) increased with any of the three anti-hypoxemic maneuvers (SpO2 over 90%, p<0.05 to p<0.01). Immediately after tracheal aspiration a drop in the SpO2 could be detected in all newborns. However, patients receiving hyperoxia showed SpO2 values higher (87.1±1.8%) than those observed with control maneuver (76.9±2.3%, p<0.01). From this point onwards, all newborns in all conditions (even those with control maneuver) had spontaneous increments of SpO2 that at 300 s were again higher than their respective basal values (p<0.05 to p<0.0005). At this time, SpO2 values from patients receiving hyperoxia or hyperventilation were still higher than those of control group (p<0.05).

CONCLUSIONS: Our results show that, similar to what occurs in other ages, tracheal aspiration in mechanically ventilated newborns causes transient hypoxemia, which can be partially prevented by previous administration of anti-hypoxemic maneuvers, specially hyperoxia.