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Effect of maturation on oral breathing in sleeping premature infants.

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To evaluate the influence of postnatal maturation on oral breathing, we measured nasal and oral ventilation during sleep and the ventilatory response to nasal occlusion in 11 preterm infants. Studies were repeated at 31-32, 33-34, and 35-36 weeks postconceptional age. Premature infants had rare episodes of spontaneous oronasal breathing during sleep. The frequency of oral breathing in response to nasal occlusion increased with advancing postconceptional age, from 8% +/- 8% at 31-32 weeks to 26% +/- 18% at 33-34 weeks and 28% +/- 33% at 35-36 weeks. Oral breathing in preterm infants, unlike that in term infants, was characterized by intermittent airway obstruction leading to a significant decrease in respiratory rate, tidal volume, minute ventilation, and $t\text{pO}_2$ (P less than 0.005). When inspiratory (RI) and expiratory (RE) resistances during nasal and oral breathing were compared, RI increased from 41 +/- 30 to 234 +/- 228 (P less than 0.004) and RE from 62 +/- 16 to 145 +/- 43 cm H₂O X L⁻¹ X sec (P less than 0.004). The ability of preterm infants to use the oral route of breathing thus increases with advancing postnatal maturation, but its effectiveness may remain limited by high oral airway resistance.

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