

# Influence of effective noninvasive positive pressure ventilation on inflammatory biomarkers in pediatric patients with spinal muscular atrophy type I.

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Argomento: Terapia Intensiva Pediatrica

**BACKGROUND:** Noninvasive positive pressure ventilation (NPPV) using effective pressure levels improves survival in stable pediatric patients with **spinal muscular atrophy (SMA)** type I type I. However, the underlying mechanisms remain unclear. This study investigated the influence of effective NPPV on a panel of cytokines.

**METHODS:** Peripheral blood samples were drawn before and 120 days after the initiation of NPPV and analyzed by flow cytometric bead array and ELISA.

**RESULTS:** 14 patients (forced expiratory volume in 1 s  $33,4 \pm 18.2\%$  predicted) were included. NPPV (inspiratory positive airway pressure  $22,8 \pm 3,3$  mbar; breathing frequency  $24,4 \pm 2,2$ /min) significantly improved arterial carbon dioxide pressure (PaCO<sub>2</sub>), both during daytime spontaneous breathing ( $p = 0.005$ ) and nighttime ventilation ( $p < 0.001$ ). Serum interleukin (IL)-10 levels were slightly reduced ( $p = 0.014$ ), whereas IL-1 ( $p = 0.062$ ) and IL-12 ( $p = 0.092$ ) showed only a tendency towards change over time. TLR-4 significantly decreased by a mean of  $24,18 \pm 11.12$  ng/L after 120 days NPPV ( $p = 0.012$  vs baseline). The decrease in PaCO<sub>2</sub> during daytime spontaneous breathing was positively correlated with the reduction in TLR-4 (correlation coefficient 0.513;  $p = 0.013$ ).

**CONCLUSION:** Effective NPPV impacts on systemic inflammation in **spinal muscular atrophy** type I pediatric patients. Furthermore, reductions in PaCO<sub>2</sub> during NPPV were associated with decreases in TLR-4 levels.

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