Non-invasive ventilation in children with severe scoliosis

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Abstract

Summary. Objectives: After corrective for scoliosis, postoperative pulmonary complications lead to increases in morbidity, length of hospital stay and mortality. This study aimed to identify associations with such respiratory complications. Methods: This retrospective cohort study included all children aged [?]17 years who underwent spinal surgery for scoliosis between January 2009 and January 2012 at a quaternary paediatric hospital. Factors associated with severely compromised pulmonary function (SCPF) were established and correlations with the occurrence of postoperative pulmonary complications and length of hospital stay (LOS) were identified. Rresults: Altogether, 133 children had corrective surgery for scoliosis, aged 12.7 (range 2-17) years at operation. Scoliosis causes were identified as: idiopathic (39.8%), neuromuscular disease (32.2%), syndrome (15.7%) and congenital (12%). Correlates with SCPF (FVC<40% predicted, n=10) included markers of sleep hypoventilation, including serum bicarbonate [?]29 mmol/L, morning pCO2 >50 mmHg (P=0.003), and overnight, episodic CO2 retention of >7 mmHg, thus an additional 8 children with SCPF were identified. Post-operative pulmonary complications were seen in 24 children (18%) and their occurrence correlated with higher Cobb angle (>90°), lower pulmonary function (FVC), higher serum bicarbonate and underlying neuromuscular disease. Amongst 18 children with SCPF, regular use of NIV pre-operatively was associated with reduced rate of post-operative pulmonary complications (P =0.02) and reduced LOS by 6.4 days (P =0.01). Conclusion: Nocturnal hypoventilation identifies children with SCPF. Use of NIV in children with SCPF was linked to fewer post-operative pulmonary complications and reduced duration of hospital stay. Keywords: Ventilation ; Pulmonary complications ; Scoliosis ; Polysomnography.

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