## Pneumonia Induced Mortality and Risk of Pneumonia in Children with Cerebral palsy with Scoliosis Treated with and without Surgery

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INTRODUCTION:

Scoliosis is common in children with cerebral palsy (CP). Severe scoliosis leads to decreased health related quality of life (HRQoL) and pulmonary compromise. Scoliosis surgery in children with CP increases HRQoL and reduces caregiver burden, but effects of scoliosis surgery on incidence of pneumonia and pneumonia-related mortality remain obscure. The purpose of this study was to compare incidence of pneumonias and pneumonia-related mortality in scoliotic children with CP with and without spinal deformity surgery.

## METHODS:

We identified 4571 children born between 1987 and 2020 who had been diagnosed with CP between 1996 and 2022 from national registries, of these 474 children with CP had been diagnosed with scoliosis. Two hundred and thirty-six had not been operated and 238 were operated for scoliosis during the follow-up median 17.8 (IQR 11.7-25.7) and 23.0 (IQR 18.4-28.2) years, respectively. Associated co-morbidities, demographic data, incidence of pneumonias and pneumonia-related mortality were analyzed between non-surgically and surgically treated children with CP and scoliosis. To compare groups and assess the impact of surgery, we established the index timepoints as the age at the diagnosis of scoliosis (12.1 years) for the non-surgical group and the age at surgery (12.9 years) for the surgical group. RESULTS:

Children with CP and scoliosis with non-surgical and surgical treatment were diagnosed with scoliosis at the age of 12.1 and 12.5 years, respectively. Length of gestation and birth weight was similar in both groups. Both groups had similar rates of developmental disability, epilepsy, and gastrostomy. During follow-up 47.9% in non-surgical and 54.2% in surgical group had been diagnosed with pneumonia. However, there was statistically significant difference in cumulative incidence of pneumonia between groups before and after index timepoint. In non-surgically treated group, there was 192.8 hospitalizations for pneumonia before and 203.9 after the index timepoint for 1000 follow-up years (p=0.334). In surgically treated group there was 175.5 hospitalizations for pneumonia before and 121.5 after the surgery for 1000 follow-up years (p<0.001). During the follow-up pneumonia related mortality was significantly higher in the non-surgically treated group than in the surgically treated group (n=22/236, 9.3% vs. n=8/238, 3.3%, p=0.008) (Fig. 1.).

## DISCUSSION AND CONCLUSION:

These results indicate that surgical treatment of scoliosis in children with CP reduces incidence of pneumonia and pneumonia-related mortality.

