Estimating Surgical Hospitalization Cost of Pediatric Chiari 1 Malformation

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Introduction

To date, no large-scale study has analyzed cost-drivers in surgery for Chiari Type 1 Malformation (CM-1). The objectives of the study are to develop a cost model for hospitalization costs(HC) in pediatric CM-1 and to examine risk factors for increased costs.

Methods

Data was extracted from 2009 Healthcare Cost and Utilization Project's Kids' Inpatient database. The study cohort comprised patients aged 0-20 years who underwent CM-1 surgery. Patient charges were converted to costs by a Cost-to-Charge Ratio. The natural log-transform of HC was analyzed. Simple and multivariate regression were modeled to determine factors associated with increased CM-1 surgical hospitalization costs. Analyses were conducted with SAS®9.4 and STATA 13.0 software.

Figure 2: Cohort flow diagram

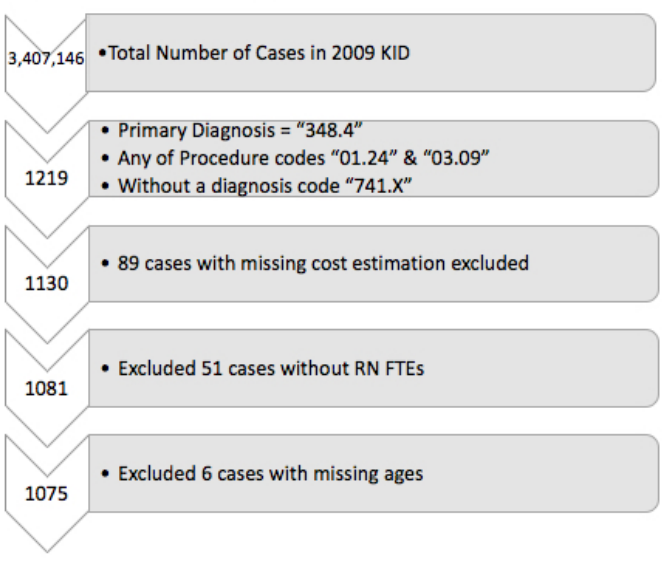
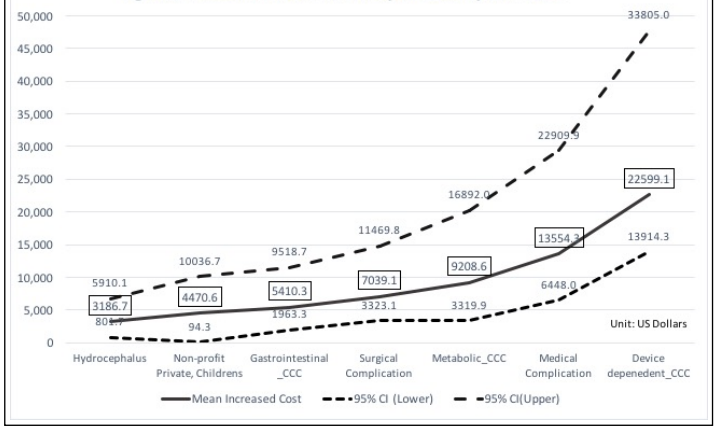


Figure 1: Incremental Increase in Hospital Costs by Covariates



Results

1071 patients were included. Mean and median ages were 10.4 and 11 years. Payers included public (32.5%) and private insurers (61.8%). Patients were mostly treated in children's units within adult hospitals (41.4%) and freestanding children's hospitals (29.1%).

Average cost and length of stay for CM-1 surgery were $16,016 USD (range 4,022-95,407, 95% CI 15,454-16,578) and 3.7 days (range 1-48, 95% CI 3.6-3.9), respectively. Patient residence in the highest median household income quartile was associated with higher hospitalization costs. Among all regions, the South US region tended to have lowest costs while freestanding children's hospitals and higher registered nurse (RN) full-time equivalents (FTEs) tended to have higher costs overall.

Patients who had hydrocephalus(24.2%) or syringomyelia(10.8%), device dependent complex chronic conditions (CCC) (155.4%), metabolic CCC(51.9%), gastrointestinal CCC(28.3%), medical(63.8%) or surgical(27.1%) complications were more likely to have higher HC than patients without these conditions.

Conclusions

Geographic practice variation, comorbidity, CCC, medical and surgical complications were significantly associated with increased CM-1 hospitalization cost.

Learning Objectives

Identify drivers of increased costs of Chiari 1 malformation surgery based on cost model development.

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