

# Association of Elevated Tricuspid Regurgitation Velocity with Cerebrovascular and Kidney Disease in Children with Sickle Cell Disease

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## Abstract

**Background:** Tricuspid regurgitation velocity (TRV), measured by echocardiography, is a surrogate marker for pulmonary hypertension. Limited pediatric studies have considered the association between TRV and surrogate markers of end-organ disease. **Methods:** Therefore, we conducted a cross-sectional study that evaluated the prevalence of elevated TRV [?] 2.5 m/s and its associations with renal and cerebrovascular outcomes in children with SCD 1-21 years of age in two large sickle cell cohorts, the University of Alabama at Birmingham (UAB) sickle cell cohort, and the Sickle Cell Clinical and Research Intervention Program (SCCRIP) cohort at St. Jude Children's Research hospital. We hypothesized that patients with sickle cell disease with elevated TRV would have higher odds of having either albuminuria or cerebrovascular disease. **Results:** We identified 166 children from the UAB cohort (mean age:  $13.49 \pm 4.47$  years) and 325 children from the SCCRIP cohort (mean age:  $13.41 \pm 3.99$  years) with echocardiography. The prevalence of an elevated TRV was 21% in both UAB and SCCRIP cohorts. Elevated TRV was significantly associated with cerebrovascular disease (OR 1.88 (95% CI: 1.12- 3.15)) and persistent albuminuria (OR: 1.81 (95% CI: 1.07– 3.06)) after adjusting for age, sex, treatment, and site. **Conclusion:** This cross-sectional, multicenter study identifies associations between surrogate markers of pulmonary hypertension with kidney disease and cerebrovascular disease. A prospective study should be performed to evaluate the longitudinal outcomes for patients with multiple surrogate markers of end-organ disease.

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Figure 1 Stepwise models for combined UAB and St. Jude cohort 8 29 23.docx available at <https://authorea.com/users/667687/articles/667816-association-of-elevated-tricuspid-regurgitation-velocity-with-cerebrovascular-and-kidney-disease-in-children-with-sickle-cell-disease>

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Table 1 Sample Characteristics of Patients by Cerebrovascular Disease Status.docx available at <https://authorea.com/users/667687/articles/667816-association-of-elevated-tricuspid-regurgitation-velocity-with-cerebrovascular-and-kidney-disease-in-children-with-sickle-cell-disease>

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Table 2 Sample Characteristics of Patients by Persistent Albuminuria Status.docx available at <https://authorea.com/users/667687/articles/667816-association-of-elevated-tricuspid-regurgitation-velocity-with-cerebrovascular-and-kidney-disease-in-children-with-sickle-cell-disease>

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Table 3 Combined UAB and St.Jude Cohorts.docx available at <https://authorea.com/users/667687/articles/667816-association-of-elevated-tricuspid-regurgitation-velocity-with-cerebrovascular-and-kidney-disease-in-children-with-sickle-cell-disease>