



Incidence of Venous Thromboembolism among Youth with Sickle Cell Disease



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Background

- Previous studies have found that individuals with sickle cell disease (SCD) are at higher risk for venous thromboembolism (VTE) compared to age- and sex-matched controls.
- VTEs are rare in children but increasing in frequency over time.
- Adolescents are at increased risk of VTE compared to other pediatric age groups.
- Previous studies in SCD individuals were performed in limited, cross-sectional, and primarily adult populations.

Objectives

- Describe the incidence rate of VTE among a population of children living with SCD and compare to those without SCD.
- Describe the probability of VTE in adolescents with SCD.

Methods

- The Michigan Sickle Cell Data Collection (MiSCDC) program is a multi-source public health surveillance system funded by the CDC.
- Children <18 years of age with SCD were identified from 2020-2022 through the MiSCDC program using validated methods.
- VTEs in the acute care setting were identified using ICD-10-CM diagnosis codes from Michigan and all payer discharge databases.
- Age-adjusted incidence rates of VTE and 95% confidence intervals (CIs) were calculated using age groups of <1, 1-4, 5-9, 10-14, and 15-17 years.
- The VTE incidence rate for children with SCD was compared to the age-adjusted VTE incidence rate in children without SCD in Michigan using census data as the denominator.
- Three-year cumulative incidence of VTE was calculated for adolescents age 15-17.

Results

- A total of 1,357 children with SCD contributed 2.7 years of observation on average (mean age = 8.7; 51.0% female).

The age-adjusted incidence rate of VTE among children with SCD was 18.5 (95% CI: 11.5-25.4) per 10,000 person-years (Figure 1).

In contrast, the age-adjusted incidence rate of VTE among children without SCD was 0.8 (95% CI: 0.7-0.8) per 10,000 person-years (Figure 1).

Figure 1. Incidence rate of VTE for children with SCD vs. those without SCD, Michigan, 2020-2022

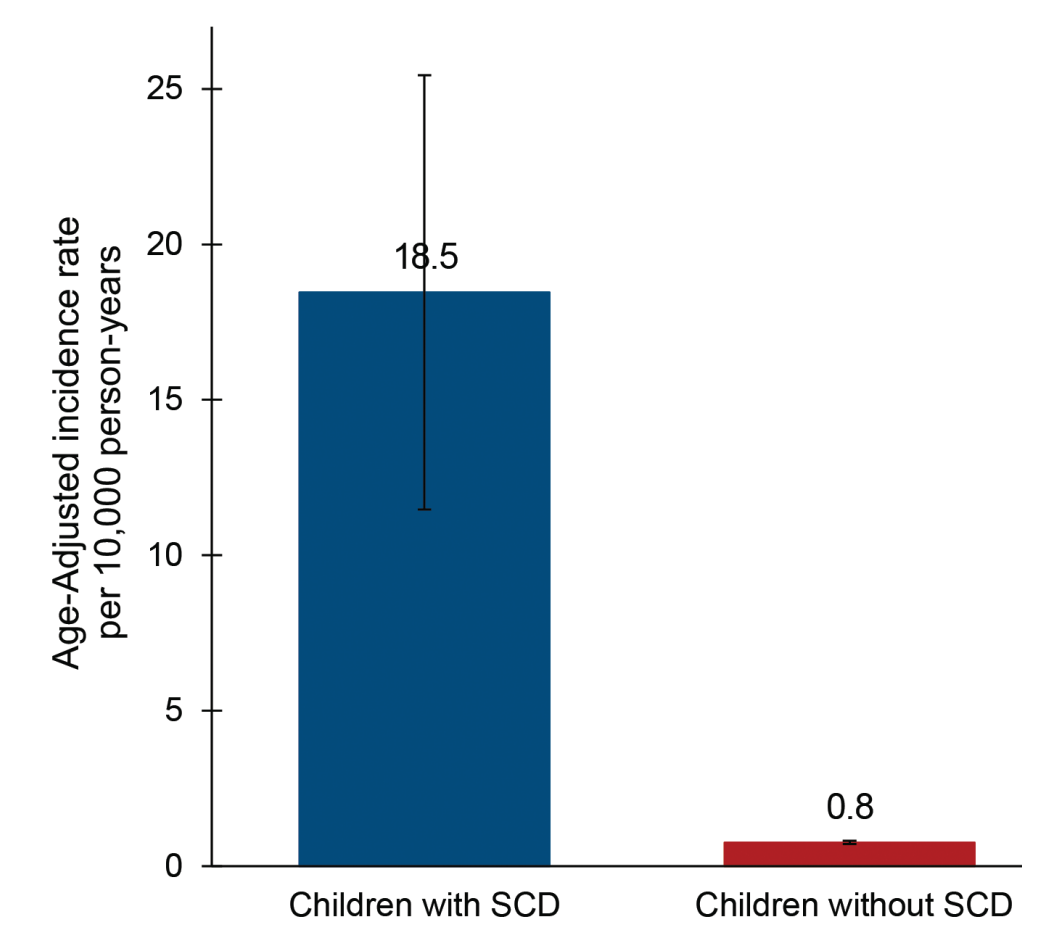
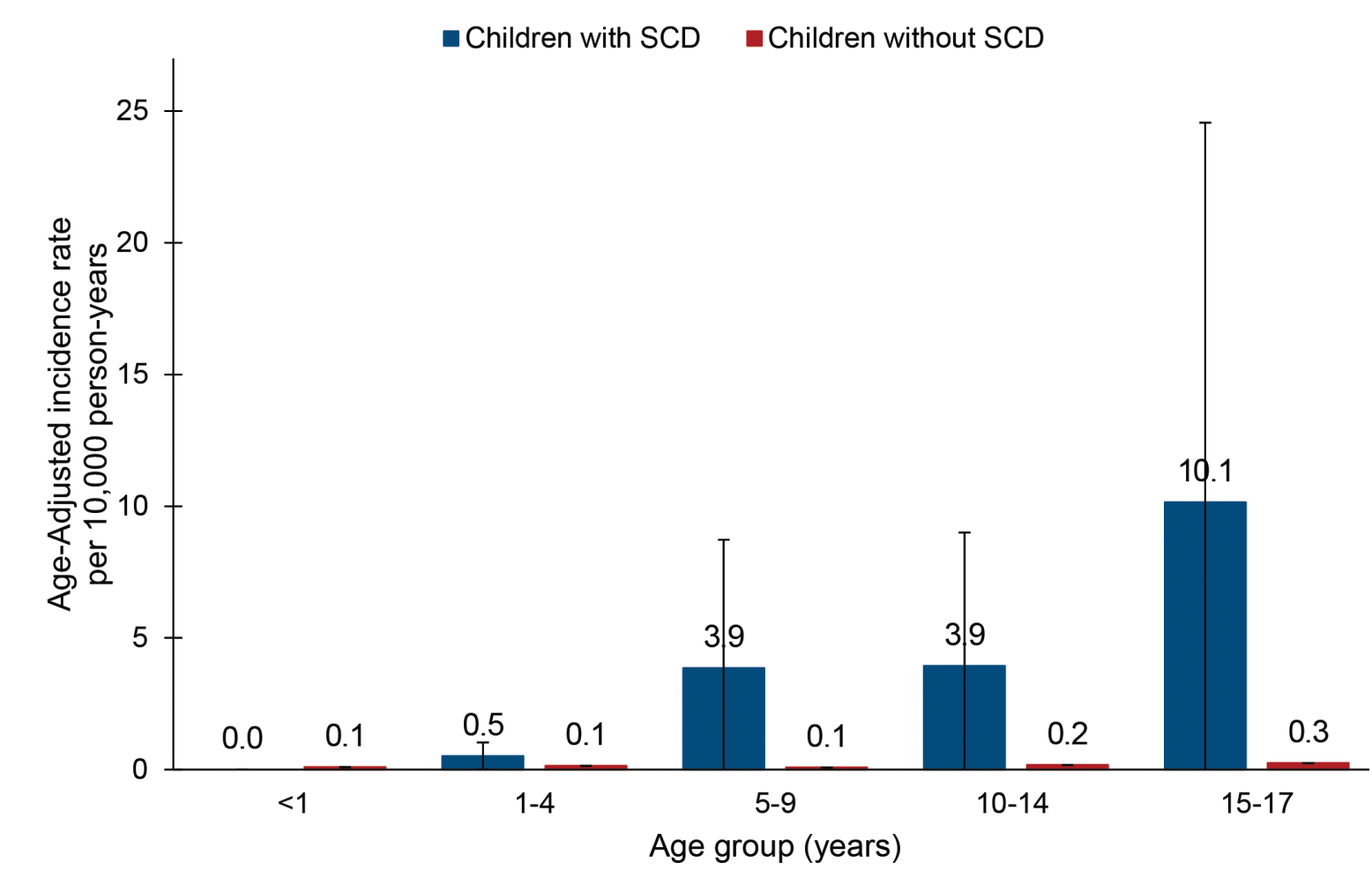


Figure 2. Incidence rate of VTE for children with SCD vs. those without SCD by age group, Michigan, 2020-2022



The rate of VTE was highest among adolescents aged 15-17 with SCD (Figure 2). The probability of an adolescent aged 15-17 with SCD developing a VTE in a three-year period was 0.3%.

Conclusions

- Although VTEs are rare, the age-adjusted incidence rate of VTE for children with SCD was 18 times higher than for children without SCD.
- The higher rates among adolescents may reflect an increasing burden of thrombotic risk factors and SCD disease complications with age.
- As VTE is an independent risk factor for VTE recurrence and mortality, additional research is needed to understand predictors in pediatric SCD populations to optimally target prevention.
- Future directions:
 - Investigate rate differences by sex to understand drivers of increased risk in adolescents.
 - Investigate rate differences associated with central line use in SCD populations.

Contact Information



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