

Intravenous Fluid Therapy and Hospital Outcomes for Vaso-Occlusive Episodes in Children, Adolescents, and Young Adults with Sickle Cell Disease

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Abstract

Background: While intravenous fluid (IVF) therapy in patients with sickle cell disease (SCD) admitted for a vaso-occlusive episodes (VOE) can help reduce red blood cell sickling, clinical practice varies across institutions. We examined the relationship between IVF therapy and hospital length of stay (HLOS), as well as adverse events, such as acute chest syndrome (ACS), pediatric intensive care unit (PICU) transfer and 28-day readmission. **Methods:** This is a single-center retrospective analysis of SCD VOE hospitalizations between January 2015 and April 2020. Patients with SCD, age 0-30, with consecutive hospitalizations for VOE were included. For the first 3 days of each admission, an "IVF ratio" was calculated by dividing actual IVF rate administered by weight-based maintenance IVF (mIVF) rate. **Results:** A total of 617 hospitalizations for 161 patients were included. Mean HLOS was 5.7 days, (SD 3.9), and mean IVF volume over the first 3 days of admission was 139.6 ml/kg/day (SD 57.8). Multivariate analysis showed that for each additional 0.5 times the mIVF rate, HLOS increased by 0.53 days ($P < 0.001$; 95% CI: 0.609–0.989), but there was no significant association between IVF therapy and adverse events. History of chronic pain was associated with increased odds of readmission (OR, 6.4; 95% CI: 3.93 – 10.52). **Conclusions:** Despite the theoretical potential for IVF therapy to slow down the sickling process, our findings suggest that increased IVF therapy was associated with prolonged HLOS, which places a burden on patients, families, and the health system.

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