Treatment of Vaso-Occlusive Pain Related to Sickle Cell Disease in Pediatric Patients: A Systematic Review

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Studies were included in the review if they were randomized controlled trials. Trials must include participants 18 years and younger with sickle cell disease. The intervention must be a comprehensive literature search provided 1,094 results, including duplicate placebos. Screening of the literature search results identified 16 trials that needed further evaluation. Six trials were included in the systematic review, after application of the inclusion and exclusion criteria. Studies are summarized in Figure 3 and Table 1. Many studies were excluded resulting from lack of rigor in study design or missing results.

Studies were evaluated for rigor using the JADAD score, and were included if the score was more than 3.

Literature searches were conducted using PubMed, Embase, Cochrane Central Register, and ClinicalTrials.gov. Search terms included (but were not limited to): “sickle cell disease” and “vaso-occlusive crises in pediatric patients”. The literature search was comprehensive and complete. Weaknesses include the small sample sizes in trials, differences in pain scales used, and differences in the time periods in which pain was measured during the crisis. Each trial measured pain scores at different points throughout treatment, and it is difficult to compare and generalize the different results. Limited published trials exist that are controlled clinical trials with strong designs.

The purpose of this literature review was to evaluate the safety and efficacy data of selected trials, provide a summary of evidence-based treatments, and identify specific areas where more studies are needed in the treatment of vaso-occlusive crises in pediatric patients.

CONCLUSIONS

Based on the results of the literature review, intranasal fentanyl and L-arginine have some evidence for use in pediatric patients with vaso-occlusive crises. More evidence is needed; however both may be safe and effective, options in patients with uncontrolled pain as an adjunct to standard therapy.

Treatments are needed with larger sample sizes to detect a smaller change in outcomes. It would be beneficial if trials used a standard pain scale, easing the comparison between trials. Studies in this population are difficult because of the subjectivity of endpoints, such as pain and length of stay. Length of stay may be influenced by many non-treatment related factors (e.g., discharge paper work), although it was included in many of the reviewed trials as a primary or secondary outcome. Future reviews may evaluate the efficacy of medication for vaso-occlusive crises based on different outcome measures. The ethical concerns of studying medications in children, the lack of incentives for studying rare diseases, and the subjectivity of pain make studying the management of vaso-occlusive crises in pediatric patients very difficult, however this review provides information regarding safe and effective, evidence-based treatments for pediatric patients with vaso-occlusive pain.

REFERENCES