Use of regional anesthesia (RA) for post-surgical pain in pediatric patients has increased over the past decade due to rise of non-neuraxial, peripheral nerve blocks (PNBs) (1,2). RA is a valuable option as it decreases opioid use, minimizes opioid side effects and provides good analgesia. Clinical efficacy is predicated on a high technical success rate. Used in combination with general anesthesia, PNB placement occurs predominantly post-induction and determining its success is delayed until after surgery. Limited data exists quantifying the technical success of PNB in pediatric patients. It is difficult to assess risks, benefits and analyze outcomes if technical success of PNBs is unclear. Use of ultrasound for nerve localization has decreased failure rates of PNBs in adults but no studies exist for children (3). We created a database to prospectively collect data related to RA success. Our hypothesis is that PNBs have a low incidence of technical failure. Secondary outcome is to identify patterns of technical failure.

A total of 224 PNBs were evaluated including 9 different RA techniques. Seven patients had no numbness in the expected distribution of the PNB, demonstrating a failure rate of 3.1 percent. Three patients rated severe pain. Twenty-five patients had moderate pain. Failed PNBs included two popliteal sciatic, two anterior sciatic, two TAP and one femoral. All PNBs were single injections using ultrasound guidance performed by pediatric anesthesia fellows under the supervision of a pediatric regional anesthesia attending.

Methods

After obtaining IRB approval, we performed a single center observational study to assess success of RA in verbal children. Over a 12-week period, patients were assessed 15 minutes prior to discharge from the PACU. A checklist was performed to evaluate evidence of numbness in the dermatomal distribution consistent with the PNB performed, presence of moderate (Numeric Rating Score 5-7) or severe pain (NRS 8-10), and if pain occurred in the distribution of the expected area to be covered by the PNB. Numbness was defined as sensory changes to light touch or temperature.

Results

This pilot study serves as a measure of institutional quality assurance and suggests that PNBs in pediatric population has a high success rate. Sciatic nerve blocks are especially prone to failure. Limitations include inability to perform a consistent method for evaluation of sensory changes. A larger study is needed to determine which PNBs and techniques have a higher failure rate in order to improve overall success of RA in pediatrics.

Conclusion

References