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Spinal Needle Gauge & Type and PDPH Incidence in Orthopedic Patients

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Introduction

Spinal anesthesia is commonly utilized for lower extremity orthopedic procedures as either the sole or adjunct anesthetic. Post-dural puncture headache (PDPH) is a well-known potential complication of spinal anesthetics, defined as a positional headache associated with a disruption of the dural membrane that is worse with sitting or standing and improves with lying down. These headaches can be debilitating for patients when they occur and sometimes require the performance of an additional procedure (and thus increased risk of complications and additional incurred cost) such as an epidural blood patch to resolve completely. It is well known that the risk of PDPH increases for larger gauge needles and non-pencil point cutting needles in the obstetric population receiving spinals for labor. These patients are female and younger, which are established risk factors for PDPH1. This has led many practitioners to prefer utilizing smaller, non-cutting needles to perform spinal injections. However, it is not clear if PDPH risk factors are the same for patients undergoing lower extremity orthopedic procedures, who tend to be older and are not all female. It is not uncommon for older orthopedic patients to also have narrowed intervertebral spaces, osteophytes, and thicker, more brittle ligaments between vertebral processes, making successful performance of spinal anesthesia more difficult2. Practitioners anticipating these changes may opt to use a larger gauge cutting needle to increase the chance of a successful spinal injection due to its increased stiffness, resulting in better resistance to bending and more predictable needle placement, as well as its ability to pass more easily through brittle ligaments. Better clarity regarding the risk of PDPH with spinal needle gauge and type in the orthopedic population could positively influence choices made by anesthesiologists performing spinals for these patients and help avoid increased morbidity and cost. We conducted a retrospective chart review to examine PDPH incidence in patients who received spinal injections for orthopedic procedures to compare the incidence of PDPH between a 22 gauge Quincke cutting needle vs a 25 gauge pencil-point needle at our institution.

Materials and Methods

Approval was obtained by our institutional IRB prior to commencing this study. Medical records for patients who received spinal injections for orthopedic procedures were examined between July 1, 2014 to October 31, 2020, the time frame where our institution utilized the same electronic medical record (EMR). PDPH was identified by CPT codes G97.1 (after 2016) and 3494.0 (prior to 2016). Included patients were all aged 18 years or older. Exclusion criteria included emergency surgery, the presence of hardware in the lumbar spine prior to the performance of the spinal injection, and patients who had a pre-existing diagnosis of migraines or other headache syndrome prior to the surgery in question.

Collected data included age, sex, surgery type, PDPH diagnosis, re-hospitalization within 14 days of surgery, and BMI. Due to inconsistencies with charting procedures at our institution, we could not obtain reliable data on the approach (median vs. paramedian) or number of attempts required for successful spinal injection. Differences between groups were analyzed using a t-test or Wilcoxon Rank-Sum test for parametric and non-parametric data, respectively. Categorical data was analyzed using the chi-square test with Yates continuity correction. P values <0.05 were considered significant.

Results/Case Report

Preliminary data was obtained for a total of 3980 patients, with ages ranging from 18 to 90 years old. There were 1902 males and 2078 females. Average BMI was 29.57. No incidences of PDPH were found for these patients at our institution who fit the above inclusion/exclusion criteria. Final data analysis is still pending but will be presented on the final poster.

Discussion

Based on preliminary data, none of the patients in this study at our institution suffered from PDPH. This suggests that the needle type utilized for spinals in the orthopedic population does not influence PDPH incidence. While this would more often encourage use of larger gauge cutting needles to facilitate easier and quicker performance of spinal anesthesia, we would still advocate for practitioner judgement in rational needle selection, namely smaller, non-cutting needles for patients identified in obstetric anesthesia studies as being higher risk for PDPH (younger, female).

References

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Disclosures

No

Tables / Images