Postdural puncture back pain has a reported incidence ranging from 2% to 29% following the administration of a spinal anesthetic. The purpose of this investigation was to compare the back pain and patient satisfaction scores after the administration of a spinal anesthetic with or without the use of an 18-gauge introducer needle.

Eighty-four men and women were randomly assigned to either control or experimental groups; 67 were included in data analysis. The control group (n = 33) received spinal anesthesia using only a spinal needle, while the experimental group (n = 34) received spinal anesthesia using an introducer needle to guide the placement of the spinal needle. Pain measurements were measured using a 100-mm Visual Analogue Scale upon arrival in the postanesthesia care unit, and at 24, 48, and 72 hours postoperatively. Patient satisfaction scores were evaluated using a 1 to 5 Likert scale.

No significant differences were found between groups concerning back pain or patient satisfaction scores upon discharge from the postanesthesia care unit, nor at 24, 48, and 72 hours postoperatively. However, a significant increase in the number of redirections between groups was observed in the nonintroducer group; despite this, back pain and patient satisfaction scores were not affected.

Key words: Back pain, introducer needle, postdural puncture back pain, spinal anesthesia, spinal needle.
domly assigned to an experimental or control group using a random numbers table. The experimental group had an 18-gauge introducer needle placed midline at the site of local injection and through the supraspinous and interspinous ligaments. A 24-gauge Sprotte needle was passed through the introducer needle to puncture the dura. The control group had a 24-gauge Sprotte needle placed without the use of an introducer needle.

Preoperatively subjects were given explicit instructions on how to complete the Visual Analogue Scale (VAS) and satisfaction scales. Subjects were blinded as to their group assignment. Subject exclusion criteria included patient history of (1) back pain, (2) preoperative opioid use, (3) pregnancy, (4) current care by a mental health professional, or (5) refusal of or contraindication to subarachnoid block.

All subjects were taken to the operating room, placed in a seated position and prepped in an aseptic fashion. Local anesthesia of the skin was achieved with 1% lidocaine using a 24-gauge 1½-inch (3.81 cm) needle infiltrated to the depth of the needle at the midline of the L3-4 or L4-5 interspace. The number of redirections was recorded for both control and experimental groups as frequency data. Redirection was defined as the withdrawal of the spinal needle in order to change direction and readvance for desired placement. Subjects then received 0.75% bupivacaine through the spinal needle after verification of proper needle placement by presence of cerebrospinal fluid. All patients were in a neutral supine position for the entire procedure.

A 100-mm VAS (0 = no pain, 100 = worst pain imaginable) was administered upon discharge from the postanesthesia care unit (PACU) and at 24, 48, and 72 hours postoperatively. A 5-point patient satisfaction survey was administered at 24, 48, and 72 hours during the postoperative period. The 5-point Likert scale consisted of (1) completely dissatisfied with the amount of back pain, (2) dissatisfied with the amount of back pain, (3) somewhat satisfied with the amount of back pain, (4) satisfied with the amount of back pain, and (5) completely satisfied with the amount of back pain. The evening of the first postoperative day, the investigators called the subjects only as a reminder to complete the forms and to answer any of the subjects’ questions. Data collection was completed by mail.

Descriptive statistics were used for demographic variables on the 67 subjects with completed data sets. Satisfaction scores were recorded at 24, 48 and 72 hours and were analyzed using \( \chi^2 \) statistical methods. The 100-mm VAS scores performed at discharge from PACU, 24, 48, and 72 hours postoperatively were analyzed with the Mann-Whitney U test for both groups. In addition, to examine whether or not the severity of back pain changed over time, the median VAS for the periods of 24 to 48 hours, 48 to 72 hours, and 24 to 72 hours were compared by a Mann-Whitney U test and analyzed as separate variables. A P value of <.05 was considered significant. Prior to the initiation of this investigation, a power analysis determined a sample size of 36 subjects per group would be sufficient to detect a minimal difference between groups of 20 mm on the VAS when a power of .80 and an alpha of .05 were used.

Results

Of the 84 outpatients enrolled in this investigation, 17 (21%) were lost through attrition, leaving a total of 67 (79%) subjects for data analysis. An unanticipated change in surgical plan for 3 subjects resulted in conversion to general anesthesia. The remaining 14 subjects failed to return their patient satisfaction scores and VAS data. No significant difference in demographic variables was noted between groups (Table).

\( \chi^2 \) analysis between groups on patient satisfaction scores at 24 (P = .73), 48 (P = .70), and 72 (P = .58) hours postoperatively were not significantly different. Median VAS scores at PACU, 24 (P = .95), 48 (P = .95), and 72 (P = .59) hours postoperatively were not significantly different between groups (Figure). There was 1 significant difference found between the control and experimental group. The number of redirections in the nonintroducer group (3.175 ± 2.934) was significantly higher than the number of redirections in the introducer group (1.487 ± .293) (P = .008). The incidence of pain for both groups combined, defined as a VAS score of 30 mm or greater, was 14% at 24 hours, 8% at 48 hours, and 7.5% at 72 hours. Subjects reported being very satisfied with spinal anesthesia regardless of the technique utilized. The combined satisfaction scores (4 or 5 on 5-point Likert scale) indicating complete satisfaction with only mild back discomfort were 92% at 24 hours, 89.5% at 48 hours, and 95.5% at 72 hours.

A combined analysis of both experimental and control groups to evaluate if back pain changed over time revealed no significant differences in median VAS regardless of technique. Median VAS for the periods of 24 to 48 hours (P = .54), 48 to 72 hours (P = .40), and 24 to 72 hours (P = .14).

Discussion

Postdural puncture backache is the most frequent postoperative complaint after spinal anesthesia. Previous investigators have reported that backache was a
common problem after spinal anesthesia and suggested that back pain might have been lower with the omission of the introducer needle. This investigation found no significant difference in the severity of back discomfort between those patients who received spinal anesthesia with or without the use of an 18-gauge introducer needle.

The control group, assigned to receive spinal anesthesia without the use of the 18-gauge introducer needle, did experience a significantly higher number of redirections. The number of redirections required to obtain cerebral spinal fluid is an estimate of the procedure’s technical difficulty. The redirections were most likely due to the fine gauge spinal needle bending as it passed through the fibrous spinal ligaments. Despite the increased number of redirections, these subjects did not report a significant difference in the severity of their back pain. This is consistent with findings from an investigation in 1950, which found that increased tissue punctures did not increase the incidence of back pain. The time required for placement of a spinal anesthetic was not measured in this study. However, the increased number of redirections could translate into increased amount of time required to anesthetize the patient.

This investigation was performed at an institution that trains nurse anesthetists and physicians. The experience level of the anesthesia providers administering the anesthetics was not recorded. The level of anesthesia training represented a limitation of this investigation. Other investigators found no correlation between experience level and postdural puncture backache. A second limitation of this investigation is the small number of women enrolled. Previous investigations have reported conflicting results as to the influence of sex on the incidence of postdural puncture backache. Our investigation enrolled only 9 women. The limited number of women did not yield enough statistical power to analyze sex as a variable in postoperative back pain.

The introducer needle does carry the risk of accidental dural puncture, but this did not occur in our investigation. The placement of the 18-gauge introducer needle did not have an impact on patient satisfaction or severity of postdural puncture backache. The results of this investigation suggest that an 18-gauge introducer needle used for the placement of spinal anesthesia does not increase the amount of postdural puncture back pain.

**REFERENCES**


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ACKNOWLEDGMENT
The Chief, Bureau of Medicine and Surgery, Navy Department, Washington, DC, Clinical Investigation Program, sponsored this report #S99-124 as required by NSHSBETHINST 6000.41A.

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