BACTERIOSTATIC NORMAL SALINE COMPARED TO BUFFERED LIDOCAINE WHEN INJECTED INTRADERMALLY AS A LOCAL ANESTHETIC TO REDUCE PAIN DURING INTRAVENOUS LINE INSERTION
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Introduction: Pain associated with intravenous (IV) insertion commonly causes fear and anxiety in patients undergoing surgery. Many patients verbalize their concerns of needle phobia as one cause of their anxieties. About 20% of adults have reported mild to intense fear when confronted with injection and approximately 10% have profound fear of needle. To reduce pain, a common procedure is intradermal (ID) injection of a local anesthesia.

Identification of the Problem: Limited data exist regarding which local anesthetics provide the best analgesia.

Purpose: This study’s purpose was to determine whether there is a significant difference in patients’ pain level with IV insertion when comparing intradermally injected buffered lidocaine (BL) to bacteriostatic normal saline (BNS).

Methodology: Using a double blinded experimental design, 376 pre-surgical patients were randomly assigned to BL or BNS group and ID or IV pain group. All were given both injections of ID and IV but only rated one pain score of post ID or post IV. Patients were asked to rate their pain only once, immediately after the ID or IV injection using a 10-point Numeric Rating Scale (NRS). Of the 184 subjects in the BNS group, 94 rated their ID pain score and 90 their IV pain score. The BL group had 192 subjects with 98 rating their ID pain score and 94 rating their IV pain score.

Results: A statistically significant difference was found in the IV pain scores with subjects who received BL reporting less pain than subjects who received BNS (1.19 ± 1.59 vs 1.72 ± 1.58; P = .025). However, no significant difference was found in the ID pain scores between BL and BNS. There were no significant differences between BL and BNS for IV placement side or site, needle gauge, prior IV and problems, vein visibility, and study nurse. Females reported higher IV pain scores than males in the BL group (1.72 ± 1.98 vs .69 ± .85; P = .001) but not in the BNS group. Also, no gender differences on reported ID pain scores were found. The primary endpoint, reported pain scores were compared between groups via Student’s t-test. Student’s t-test was also used to compare gender differences on levels of self-reported pain for both the ID and IV pain scores for BL and BNS. Chi-square or Fischer’s exact test were performed for comparing group differences on the other study variables. A two-tailed P level of .05 was considered statistically significant in all analyses.

Discussion: Overall, the results indicated that BL is more effective than BNS when injected intradermally to numb the IV site prior to IV insertion. However, while BL was statistically more effective than BNS, the reported pain score difference between the two anesthetics was less than
one point and the reported pain scores for both groups was less than two points. These findings raise important questions about the clinical significance difference between the two anesthetics. Our findings also indicate that due to the high effectiveness of both anesthetics, BNS or BL can be used to provide an anesthetic effect in both male and female patients. Also, while no significant differences were noted between BL and BNS for IV placement side or site, needle gauge, prior IV and problems, vein visibility, and study nurse, these findings appear to be of crucial relevance for perianesthesia nurses in reducing fear and anxiety in all pre-surgical patients during IV start.

**Conclusion:** This study concluded that BL is more effective than BNS in decreasing the pain with IV insertion but no difference was found with the reported ID pain. Given the number of subjects reporting a NRS score of 1 or less, both anesthetics are effective in reducing patients’ pain level. Therefore, the anesthetic effect of BNS should be given great consideration as an alternate choice, considering its low cost and ready availability.

**Implications for perianesthesia nurses and future research:** One way of promoting a positive surgical experience for the patients in the preoperative care units is to minimize the pain during IV insertion which will alleviate some of the patient’s anxieties. Our study validated the perianesthesia nurses’ standard of care in use of BL as evidence based practice in contributing to a positive patient outcome. This study also showed the effectiveness of BNS making it an alternate choice and to no analgesia. However future research is needed to further evaluate its effectiveness.