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Research Article

To Compare the Effects of Dexmedetomidine and Clonidine as An Adjuvant to Intrathecal Bupivacaine in Spinal Anaesthesia for Lower Abdominal Surgeries: A Prospective Comparative Study

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ABSTRACT

Background: α2-adrenergic agonists such as clonidine and dexmedetomidine have been used as intrathecal adjuvants to bupivacaine to enhance block quality and prolong postoperative analgesia.
Aim: To compare the efficacy of dexmedetomidine versus clonidine as adjuvants to hyperbaric bupivacaine in spinal anaesthesia for lower abdominal surgeries.
Methods: Sixty ASA I–II patients aged 18–65 years undergoing elective lower abdominal surgeries were randomized into two groups (n=30 each). Group C received clonidine 30 mcg with 12.5 mg hyperbaric bupivacaine; Group D received dexmedetomidine 3 mcg with 12.5 mg hyperbaric bupivacaine. Block characteristics, duration of analgesia, hemodynamic parameters, and complications were assessed.
Results: Demographics were comparable between groups. Mean sensory block onset was 6.43 ± 2.87 min (clonidine) vs 6.04 ± 2.93 min (dexmedetomidine, p=0.600). Motor block onset was 7.6 ± 2.85 min vs 7.02 ± 2.84 min (p=0.431). Analgesia duration was 333.3 ± 94.0 min vs 367.7 ± 89.0 min (p=0.152). Hemodynamic changes and side effects (hypotension, bradycardia) were minimal and not significantly different.
Conclusion: Both clonidine 30 mcg and dexmedetomidine 3 mcg as intrathecal adjuvants provide effective block characteristics and stable hemodynamics. Dexmedetomidine showed a non-significant trend toward earlier onset and prolonged analgesia, while clonidine remains more cost-effective.

Keywords*: spinal anaesthesia, dexmedetomidine, clonidine, bupivacaine, lower abdominal surgery, α2-agonists.*

INTRODUCTION

Spinal anaesthesia with bupivacaine provides reliable intraoperative anaesthesia but is limited by shorter postoperative analgesia. Intrathecal adjuvants have been evaluated to improve block duration and patient comfort. α2-adrenergic agonists, particularly clonidine and dexmedetomidine, have shown promise due to their sedative, analgesic, and opioid-sparing effects without significant respiratory depression.

This study aimed to compare intrathecal clonidine (30 mcg) and dexmedetomidine (3 mcg) as adjuvants to bupivacaine in patients undergoing lower abdominal surgeries.

MATERIALS AND METHODS

Design: Prospective, randomized, comparative study.
Population: 60 patients, ASA I–II, aged 18–65 years, scheduled for elective lower abdominal surgery.
Groups:
- Group C (n=30): Bupivacaine 12.5 mg + Clonidine 30 mcg
- Group D (n=30): Bupivacaine 12.5 mg + Dexmedetomidine 3 mcg

Assessments:
- Onset of sensory block (T10 level)
- Onset of motor block (Modified Bromage 3)
- Duration of analgesia (time to first rescue analgesic, tramadol 50 mg IV)
- Hemodynamic parameters (HR, MAP at intervals for 12h)
- Complications (hypotension, bradycardia, sedation)

Statistics: SPSS v20 used. Independent t-test, chi-square/Fisher's exact test. $p < 0.05$ considered significant.

RESULTS
- Sensory block onset: 6.43 ± 2.87 min (clonidine) vs 6.04 ± 2.93 min (dexmedetomidine), p=0.600
- Motor block onset: 7.6 ± 2.85 min vs 7.02 ± 2.84 min, p=0.431
- Analgesia duration: 333.3 ± 94.0 min vs 367.7 ± 89.0 min, p=0.152
- Hemodynamics: HR and MAP trends comparable; occasional bradycardia/hypotension treated effectively.
- Complications: None had excessive sedation; adverse events minimal and comparable.

DISCUSSION
Both adjuvants provided comparable efficacy with stable hemodynamics. Dexmedetomidine showed a trend toward longer analgesia, consistent with prior studies. Clonidine, however, remains a cost-effective option, especially in resource-limited settings. Importantly, both agents were free of major complications at low doses, supporting their role as opioid-sparing alternatives.

CONCLUSION
Dexmedetomidine (3 mcg) and clonidine (30 mcg) are safe and effective intrathecal adjuvants to bupivacaine in spinal anaesthesia for lower abdominal surgeries. Dexmedetomidine may offer marginal clinical benefit, while clonidine remains more economical. Further multicentre trials with larger sample sizes are warranted.

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