

Original Research Article

Bilateral superficial cervical plexus block combined with general anaesthesia for thyroid surgery-a comparative study of intraoperative haemodynamic status and safety

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ABSTRACT

Background: When general anaesthesia is employed for a surgery, the hemodynamic changes are intense during intubation, intraoperative stress and extubation. Hence, in the present study, by employing Bilateral Superficial Cervical Plexus Block using 0.5% Bupivacaine prior to skin incision, assessment of hemodynamic effects during intraoperative period is done. The aim of the study was to compare the intra operative hemodynamic status and the safety of bilateral superficial cervical plexus block with general anesthesia in thyroid surgerie.

Methods: Bilateral superficial cervical plexus block was performed in patients undergoing simple thyroid surgery using normal saline in 29 control group patients and 0.5% Bupivacaine in 29 study group patients. Intraoperative hemodynamic status was monitored in both the groups using parameters such as heart rate, systolic blood pressure, diastolic blood pressure and mean blood pressure.

Results: Hemodynamic parameters are not altered during the intraoperative period in the study and control group.

Conclusions: Bilateral Superficial Cervical Plexus Block with bupivacaine did not alter the intraoperative hemodynamic parameters.

Keywords: ASA, BSCP, Bupivacaine, Hemodynamic parameters

INTRODUCTION

Surgery or anesthesia associated with hemodynamic stress and abnormal changes in heart rate and blood pressure take place throughout the perioperative period. The cause for such change is multifactorial. When general anaesthesia is employed for a surgery, the hemodynamic changes are intense during intubation, intraoperative stress and extubation.

Hence, vigilant monitoring is required throughout the intraoperative period and early postoperative period for early recognition and effective management. In the present study, ECG, non-invasive blood pressure, pulse oximeter, end tidal CO₂ and temperature were monitored.

Previous studies have compared the postoperative analgesic effect of Bilateral Superficial Cervical Plexus Block(BSCP). But, the effects on hemodynamic features are not compared.¹⁻³ When regional anaesthesia was combined with general anaesthesia for thyroid surgery, the patients were more likely to experience good recovery in postoperative period-better energy levels and early return to work.⁴ In a study by Dieudonne et al, bilateral superficial cervical plexus block was performed only at the end of the surgery to assess the post-operative analgesic effect. The intraoperative haemodynamic status was not studied.⁵

The aim of our study is to compare the Intra operative Hemodynamic status of bilateral superficial cervical

plexus block combined with general anesthesia in thyroid surgeries and to compare the incidence of adverse effects of bilateral superficial cervical plexus block combined with general anesthesia in thyroid surgeries.

METHODS

Patients admitted to Government Medical College and ESI Hospital Coimbatore. Written informed consent are obtained from the patient to include in the study. Patients undergoing elective Thyroid surgeries are included in the study, after obtaining the ethical committee clearance.

Inclusion and exclusion criteria

Patients belonging to age group 18-60years of both sex with body weight 40-80kg under ASA (American Society of Anaesthesiologists) grade I and grade II undergoing elective operative procedures on thyroid gland were included in the study. Patients allergic to local anaesthetics, history of bleeding disorders, Substernal Goitre, patients with stridor, Thyroid malignancy, requiring block dissection, Respiratory compromise, ASA grade III and IV patients are excluded from the study. Mode of selection of cases double blinded, random sampling technique. Bupivacaine-supplied by neon pharmaceuticals.

Superficial cervical plexus block technique

A line is drawn from the tip of mastoid process to transverse process of C6 vertebra along the posterior border of the clavicular head of sternocleidomastoid muscle (shown in Figure 1). Using 23 Gauge 1.5-inch needle, 10ml of 0.5% bupivacaine is injected 15min prior to induction in a fan shaped manner at the midpoint of the above-mentioned line in the subcutaneous plane.



Figure 1: Superficial cervical plexus block technique.

Allocation to different regimens

Group I: Patients receiving superficial cervical plexus block with 10ml of Normal Saline each side.

Group II: Patients receiving superficial cervical plexus block with 10ml of 0.5 % Bupivacaine on each side.

Sample size

Considering the proportion of subjects who need additional intraoperative opioids as 55% and 20% in control and intervention group respectively, with 80% power of study and 5% alpha error, the required sample size was 29 subjects in both study and control group. Statistics software version 13 was used for sample size calculation.

Statistical analysis

Chi square test and student t-test are used appropriately to test the statistical significance of the parameters. IBM SPSS version 21 and Microsfot Excel 2013, are used for statistical analysis.

Outcome measures

Haemodynamic status are evaluated every 15min during intraoperative period using the following variables- Heart rate, Systolic blood pressure, Diastolic blood pressure and Mean arterial blood pressure. The hemodynamic parameters are measured using PHILIPS IntelliVue MP 40. To record arterial oxygen saturation, Pulse oximeter is used. ET CO₂, capnography is measured using ET CO₂ monitor. ECG is recorded in lead II, using ECG monitor. Temperature is monitored using oesophageal probe.

RESULTS

Baseline parameters

The baseline socio demographic parameters such as age and gender were comparable between the two groups.

Hemodynamic parameters

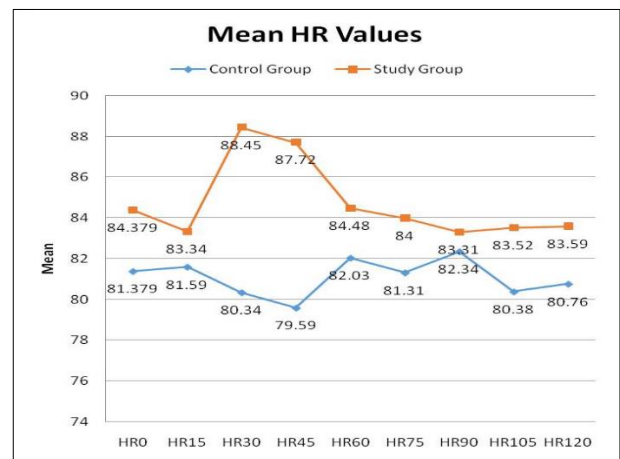


Figure 2: Trend diagram of mean values HR in two study groups (N=58).

The baseline hemodynamic parameters were compared between the study and control groups and there were no

statistically significant differences were observed Hence, both the groups were comparable. The mean values of the hemodynamic parameters were compared between the study and control groups.

Though the heart rate was constantly higher in study group, no statistically significant difference was observed in heart rate between the study and control groups during the intra operative period, except at 30 and 45minutes. The mean heart rate was 8.10 and 8.14beats/minute higher at 30 and 45minutes respectively. With p values ≤ 0.05 . (Figure 2) There is no statistically significant difference observed in the mean values of SBP, DBP and MAP between the study and control group (Figure 3,4,5).

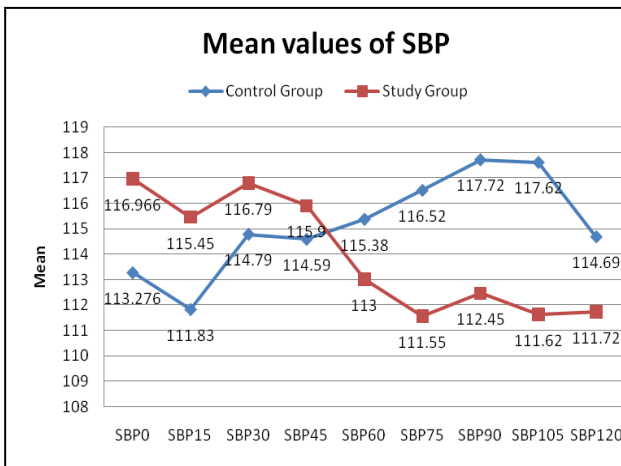


Figure 3: Trend diagram of mean values SBP in two study groups (n=58).

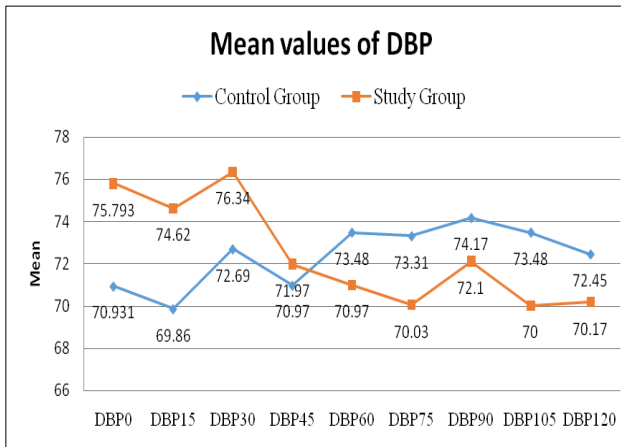


Figure 4: Trend diagram of mean values DBP in study and control groups (n=58).

DISCUSSION

Wound Infiltration of local anaesthetics, bilateral superficial cervical plexus blocks bilateral combined superficial and deep cervical plexus block reduce the general anesthetic requirements during the surgery and also significantly lowers the severity of postoperative

pain.⁵⁻¹⁰ But in these studies, the haemodynamic status during the surgery was not studied.

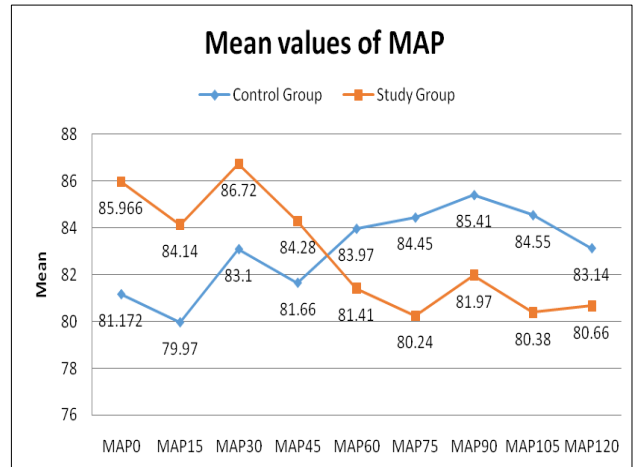


Figure 5: Trend diagram of mean values MAP in study and control groups (N=58).

However, in a study by Eti et al, use of local anaesthetic wound infiltration or use of bilateral superficial cervical plexus block did not decrease the analgesic requirement after thyroid surgery.¹¹ Also, in another study by Warschkow et al, the efficacy and safety of BSCPb in adjunct to GA was evaluated in thyroid surgery patients.¹² The risk of postoperative nausea and vomiting was also seen in patients who received BSCPb.

Hence, the proof of efficacy of combination of the BSCPb with general anaesthesia in thyroid surgery remains weak. There is a gap in the knowledge about the BSCPb in intraoperative haemodynamics in thyroid surgery. Therefore, the present study was conducted.

Considering the baseline hemodynamic parameters between the study and control groups, there is no statistically significant difference were observed. Hence, both groups are comparable.

The heart rate is constantly higher in the bupivacaine group compared to the normal saline group throughout the intraoperative period, which is statistically not significant except at 30 and 45minutes. At 30 and 45minutes, the difference in the mean heart rate was 8.1 and 8.14 beats/min respectively, with the p values ≤ 0.05 . But, after 45min, there is no statistically significant difference in the heart rate between the two groups.

Though the heart rate at 30 and 45min showed statistically significant difference between the bupivacaine and control groups, there is no statistically significant difference in heart rate after 45min.

Systolic blood pressure, diastolic blood pressure and mean arterial blood pressure did not show any statistically significant difference between the

bupivacaine and control group. Hence, we can conclude that the bupivacaine did not alter the hemodynamic parameters in the intraoperative period during thyroid surgeries.

Adverse effects

Throughout the study, no adverse effects were noted both in the bupivacaine group and normal saline group. Hence, we can conclude that the use of bupivacaine in thyroid surgeries, does not cause any adverse effects, both during intra operative and post-operative period.

CONCLUSION

The data and statistical analysis suggest that BSCPb with bupivacaine did not alter the intraoperative hemodynamic parameters. No significant adverse effects were noted both during surgery and postoperative period.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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