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RESEARCH ARTICLE

COMPARISON OF HOSPITAL STAY IN PATIENTS UNDERGOING SHOULDER ARTHROSCOPY USING INTERSCALENE BLOCK TECHNIQUE VS GENERAL ANAESTHESIA AT THE ABC MEDICAL CENTRE

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ABSTRACT

The use of peripheral blocks is increasing due to the advantages they have over general anesthesia, despite this, the use of general anesthesia is still very high in many parts of the world. The use of interscalene block is successfully employed for shoulder surgery and there is now evidence both for and against its use versus general anesthesia. This study seeks to compare hospital stay between patients undergoing shoulder arthroscopy under general anesthesia vs patients undergoing the same procedure with the use of an interscalene block. Our goal is to identify which group of patients have a longer hospital stay which can correlate with a higher number of complications. This study is a retrospective analysis of 70 subjects where we aimed to compare the number of days every patient stayed in the hospital after surgery. The resulta fo this study were that 14.30 % (n= 10) of the subjects presented some type of postanesthetic complication, where 80.00 % (n= 8) of the subjects underwent general anesthesia and 20.00 % (n= 2) underwent interscalene block, statistically significant distribution (p= 0.040) and when hospital stay was comparedthere was a statistically significant difference for a shorter in-hospital stay in subjects who underwent interscalene block (p < 0.001). These results suggest that interscalene blockade may provide adequate analgesic control as well as a shorter in-hospital stay compared to balanced general anesthesia alone and may be a better management option for the anesthesiologist if appropriately individualized for each patient.

INTRODUCTION

A great advantage of the procedures performed in orthopedics is that most can be performed under general anesthesia and/or neuroaxial/regional anesthesia, which opens up a wider range of research as to which technique is best to use. Shoulder arthroscopy is one of the most common orthopedic procedures and can be performed with general anesthesia, as well as with regional block; within these, the interscalene block is one of the most commonly used due to its adequate analgesic coverage of the surgical site. In-hospital stay turns out to be an important factor in the patient's well-being, since it reflects greater early mobility and a closer incorporation into daily life, as well as less exposure to in-hospital microorganisms and a more efficient use of economic resources, and even environmental awareness. There are still doubts as to which of these two anesthetic techniques is usually associated with a shorter in-hospital time, so this study attempts to help discern if there is any difference in this aspect in order to have one more tool with which to decide our anesthetic practice.

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SHOULDER ARTHROSCOPY

Shoulder arthroscopy currently has several advantages over open shoulder surgery since the use of fiber-optic instruments in the 1970s, such as better intra-articular visualization, lower incidence of pain, less injury to the deltoid muscle and shorter postoperative recovery (7,8). Shoulder arthroscopy progresses through history in a similar manner to knee arthroscopy in that it was first performed as a diagnostic procedure and later incorporated therapeutically (9). Shoulder arthroscopy can be performed with the patient in lateral decubitus or in a beach chair.(8) One of the most important advantages of the lateral decubitus position is a better visualization of the glenohumeral joint and the subacromial space, another is to perform the traction without the need of an assistant.(8) It should also be noted that this position allows easier access to the posterior and inferior part of the joint (8). The beach chair position was first described in 1988 with the aim of reducing the neuropathies reported in the lateral decubitus position, this complication being rarely reported in the beach chair position.(8) Other advantages include reduced risk of neurovascular complications, decreased operative time, and easier conversion to open procedure (8). The beach chair position is achieved once the patient is under general or regional anesthesia, the table should be adjusted so that the patient is seated at 60°, in

case a subacromial decompression is performed, the shoulder should be separated from the side.(10) For arthroscopic stabilization of the shoulder, the affected extremity should be moved away from the edge of the table to the medial edge of the scapula (10). The placement of the portals depends on several factors including the type of lesion and the position of the patient, it is essential to take this factor into account as it will be directly involved in the injury of structures involved in the trajectory and trans and postoperative pain (11).

GENERAL ANESTHESIA IN SHOULDER SURGERY

When general anesthesia is used, the beach chair position causes a significant impact on both mean arterial pressure and cerebral perfusion pressure which may fluctuate and stabilize up to 30 minutes after positioning (12). Jugular venous bulb oxygen saturation can be used to monitor adequate perfusion.(12) A decrease of 50% has been observed to be indicative of cerebral hypoperfusion and occurs in up to 41% of patients undergoing shoulder arthroscopy in the beach chair position under general anesthesia (12). This hypoperfusion can be explained by the fact that with the change of position there is a decrease in venous return, which leads to a reduction in cardiac output, mean arterial pressure and cerebral perfusion pressure as a consequence (12). Comparisons have also been made with different general anesthesia techniques and it has been observed that there is greater jugular vein oxygen saturation using halogenated anesthetics, specifically sevoflurane instead of total intravenous anesthesia with Propofol (13). It is important to mention that a high incidence of hospital readmission has also been observed after shoulder arthroscopies under general anesthesia compared to regional anesthesia, due to side effects associated with general anesthesia (14). In spite of this, general anesthesia generates the adequate conditions for the orthopedist to perform the arthroscopy in an optimal manner and a low incidence of complications (15). It is very helpful for the anesthesiologist to know both the procedure and the patient in order to individualize each management, such as the use of central heating methods to avoid hypothermia (16).

COMPLICATIONS OF GENERAL ANESTHESIA IN SHOULDER SURGERY

It is a fact that general anesthesia has become quite safe in the last 5 decades.(17) In spite of this, the patient is not exempt from having cardiovascular, respiratory, neurological, hepatic, renal or other organ complications since the drugs used act on the blood as a means of transport (17). Among the most frequent complications following general anesthesia are postoperative pain, nausea and vomiting, and dental damage which, although not usually lethal, imply a greater expenditure of resources and even a longer hospital stay.(17) Pain is one of the main causes of hospital admissions in outpatient surgeries and 60% of these occur in orthopedic procedures, shoulder surgery being one of the main representatives (18). Other common types of complications include cardiovascular and respiratory complications (17) Perioperative myocardial infarction has a low prevalence in shoulder surgery, but can be difficult to diagnose and prevent depending on the patient's context, the mechanism of this complication usually being an imbalance between oxygen supply and demand (17). Respiratory complications are a predictor of morbidity and mortality that has been found to be closely related to other comorbidities and prolonged hospital stay (17). Among these are atelectasis, aspiration of secretions and/or gastric contents, laryngospasm, bronchospasm and infections (17). Another important category of complications are neurological, of which one of the most frequent is postoperative cognitive dysfunction defined as a decrease in changes in pre- and postoperative neuropsychological tests with an incidence of 9.9% (17). Another important neurological complication to highlight is postoperative delirium which is an acute and fluctuating change in cognition and attention, which may include alterations in consciousness and disorganized thinking (17) Both are linked, as are the previous complications, to increased costs and longer in-hospital stay (17). There are some techniques such as the management of controlled hypotension that may result in serious complications such as cerebral and/or spinal ischemic injury and more commonly hypotensive bradycardia.(19) These complications should be taken into account in patients with certain characteristics such as advanced age or cardiovascular comorbidities (19). The position as already mentioned is also closely related to complications.(20) Hypotension being so frequent is even more prevalent in the beach chair position (20).

INTERSCALENE BLOCKAGE

There is now increasing interest in the different types of ultrasound-assisted brachial plexus blocks.(26) This is because ultrasound imaging can clearly show the necessary nerves or structures that need to be identified for the block to be performed (26). Another clear advantage of the use of ultrasound in this context is that the needle insertion can be located in real time and its trajectory can be followed, observing the exact site where the local anesthetic is deposited (26). During the administration of the local anesthetic, the distribution of the anesthetic can also be observed and its correct deposition can be corroborated (26). Interscalene blockade provides adequate analgesia to patients undergoing shoulder surgery, covering the entire sensitive area necessary for the surgeon to work comfortably (27). In addition to adequate analgesia, interscalene blockade offers a number of other benefits over general anesthesia such as reduced opioid consumption for up to 12 hours post-blockade, as well as reduced postoperative nausea and vomiting for up to 24 hours after surgery (27). The issue of analgesia has different evidences, on the one hand, there are studies that show that the opioid-sparing effect lasts up to 24 hours after the operation, but other studies report pain relief of no more than 8 hours (27). The issue of rebound pain after the block has also been mentioned and is still under debate.(27) Another point to take into account is the reduction of the postoperative care unit stay and not only that but a reduction in the in-hospital stay which leads to quite significant benefits (27). It is important to take into account that there may be a more accentuated sensory and motor block and even a complication such as paresis or motor alteration of weeks or even months of duration when an intrapleural injection is performed.(28) Therefore, the ideal is a perineural injection that can be achieved with greater incidence by performing the procedure with ultrasound (28). The classic and most widely used technique in the world is Winnie's technique, which was initially performed at the level of the sixth cervical vertebrae, originally using paresthesia as a reference for an adequate location (29). Currently, the use of neurostimulation or ultrasound is preferred for a finer placement and to avoid intrapleural injection (29)

The patient should be placed in a semi-sitting or supine position with the head turned to the side contralateral to that on which the block is to be performed (29). The patient is then asked to elevate the head so that the sternocleidomastoid protrudes. The index and middle fingers of the non-dominant hand are placed immediately behind the lateral border of the sternocleidomastoid muscle. The patient is asked to lower the head, and the anterior scalene muscle is located (29). Then, the fingers are moved posteriorly to locate the interscalene sulcus located between the anterior and posterior scalene, the needle is inserted at the level of C6 perpendicular to the skin. The needle is aspirated to rule out intravascular or intrathecal placement and a volume of between 15-20 ml is injected (29)

INTERSCALENE BLOCK IN SHOULDER SURGERY

Acute postoperative pain in shoulder surgery has a high prevalence and even a prevalence of 45% is reported for severe pain in the immediate postoperative period (30). Successful postoperative pain management can be achieved by employing single-shot or continuous analgesia with interscalene blockade.(31,32) Interscalene blockade, apart from producing adequate analgesia for shoulder surgery, can produce paralysis due to blockade of the motor components of the plexus.(30) Interscalene block has also been associated with less bleeding compared to general anesthesia.(33) This block is especially helpful in medial and inferior incisions due to its analgesic coverage.(33) Interscleral blockade gives reliable analgesia of the entire shoulder and radial aspect of the arm, but does not usually cover the ulnar aspect of the arm, forearm, and hand (34). Thanks to the fact that the anatomical references are easy to identify and with the use of ultrasound and the neurostimulator it is possible to perform this block in almost any patient, including obese patients (34). Another advantage to take into account is that it can be performed in several positions, which makes it an option in complicated situations such as shoulder dislocation or in the transoperative period (34).

Interscalene block complications: Complications of interscalene block are infrequent and the incidence is further reduced with the use of neurostimulator and/or ultrasound.(37) Peripheral nerve injury is a rare but feared complication while block failure is more frequent with a reported incidence of up to 10-15%, although the use of ultrasound to avoid this situation is also very helpful (37). Other complications can result from leaving a catheter in place to continue perfusing drugs and include nerve injury and infection, although this is a less common practice worldwide (37). There may be motor impairment following anesthesia that in most cases persists for a couple of weeks only, this is sometimes due to an intraneural injection of the drugs (38) There are some specific complications of interscalene block that are related to brachial plexus injury (39) Some of these complications are idiopathic brachial plexitis and unintended spinal or epidural anesthesia (39). A complication quite feared by the anesthesiologist is pneumothorax, even though it is more frequent in supraclavicular block (39). The incidence of this complication with traditional techniques varies between 0.6%-6%. Suggestive symptoms are cough, chest pain on deep inspiration, anxiety and dyspnea. The need for treatment depends on the degree of pulmonary collapse (40).

Another complication is the paresis of the phrenic nerve by the nerve roots of C3-C5, which can lead to an alteration in the patient's respiratory mechanics and even hypoxia (41). Cardiovascular complications include hematomas due to injury to the internal carotid artery or vertebral arteries (40). As for neurological complications, sympathetic blockade resulting in Horner's syndrome characterized by enophthalmos, miosis and palpebral ptosis. Another neurological complication is subarachnoid block or peridural block, as well as vasovagal pictures (40). Another complication is local anesthetic toxicity, which depends on the dose, the type of anesthetic, the patient's conditions and the speed of administration. This can lead to neurotoxicity, myotoxicity, cardiotoxicity or trigger a hypersensitivity response.(40)

OBJECTIVES

To compare in-hospital stay in patients undergoing shoulder arthroscopy using interscalene block technique + general anesthesia or general anesthesia alone at ABC Medical Center.

MATERIAL AND METHODS

STUDY DESIGN:

- For information gathering: Retrospective.
- By measurement of the phenomenon over time: Transversal.
- Control of assignment of study factors: Non-randomized.
- By type of analysis: Comparative.

SAMPLE SIZE CALCULATION

To calculate the sample, the formula for estimating proportions in finite populations will be used, using a confidence level of 90% and a prevalence of 72.00% for general anesthesia and 28.00% for interscalene block + general anesthesia. A sample will be calculated for the population exposed to general anesthesia and another one for the population exposed to interscalene block.

The formula used:

$$n = \frac{N Z_{\alpha}^2 \, p \, q}{d^2 (N-1) + Z_{\alpha}^2 \, p \, q}$$

Where:

N: Shoulder arthroscopies performed at the ABC Medical Center in 2021 = 91

Z_{α} : Value corresponding to the Gaussian distribution for a confidence level of 90% = 1.645

p_1 : Expected prevalence of the parameter to be evaluated (72.00 % = 0.720):

q_1 : 1-p = 1 - 0.280 = 0.280

p_2 : Expected prevalence of the parameter to be evaluated (28.00 % = 0.280):

q_2 : 1-p = 1 - 0.280 = 0.720

d: Error expected to be made 0.10 (10 % = 0.10)

$$n_1 = \frac{(91)(1.645)^2\,(0.720)(0.280)}{(0.10)^2\,(91-1) + (1.645)^2\,(0.720)(0.280)}$$

n_1 = 34 Subjects (general anesthesia group)

$$n_2 = \frac{(91)(1.645)^2\,(0.280)(0.720)}{(0.10)^2\,(91-1) + (1.645)^2\,(0.280)(0.720)}$$

n_2 = 34 Subjects (interscalene blocking group)

$N_{Total} = n + n_{12}$ = 68 Subjects

STUDY POPULATION: Subjects undergoing shoulder arthroscopy at the ABC Medical Center.

SELECTION CRITERIA

INCLUSION CRITERIA

- Subjects indistinct sex > 18 years old
- Elective procedure.
- Subjects without previous shoulder surgery.
- Subjects with interscalene type anesthetic block + general anesthesia or general anesthesia alone.

ASA I and II patients

EXCLUSION CRITERIA

- Surgical conversion
- Anesthetic conversion
- Surgery not performed at ABC Medical Center.
- Patients ASA >II

ELIMINATION CRITERIA

- Subjects who do not have the necessary information for data collection in the clinical record.

- STUDY STRATEGY: How will you obtain the information?
- Approval of protocol
- Identification of subjects meeting inclusion criteria
- Data collection
- Data analysis

STATISTICAL ANALYSIS

A descriptive statistical analysis was carried out, obtaining the results in frequencies weighted at 100% according to the categories of each qualitative variable of the study (sex, comorbidities and types, surgical side, pre- and post-surgical diagnosis, block attempts, anesthetic used, post-anesthetic complications and types, opioid and antiemetic consumption, pain scale and type of anesthetic technique); for the quantitative variables (age and in-hospital stay in hours) their distribution will be evaluated by *Kolmogorov-Smirnov* test, obtaining measures of central tendency (mean-standard deviation (SD) or median-interquartile range (IQR)), determining a nonparametric distribution from a p value < *0.05*.

Tests of association and estimation of relative risk between the type of anesthetic block used and the qualitative variables of the participating subjects will be performed by Chi-square test. For the evaluation of in-hospital stay in hours, depending on the distribution of the data, a comparison will be made by T-test for independent samples (in case of parametric distribution) or *Mann Whitney-U* test (in case of non-parametric distribution) between time and the type of anesthetic technique used. In all statistical tests, significance will be determined from a p-value < 0.05. Microsoft® Excel® was used to prepare the initial database, and the data were subsequently processed using the Statistical Package for the Social Sciences (SPSS®) v.26.

ETHICAL ASPECTS

In accordance with the Regulations of the General Health Law on Health Research, the risk of this research is considered to be without risk, since the evaluation will be carried out by retrospectively reviewing clinical records to assess the in-hospital stay of subjects who underwent shoulder arthroscopy using two anesthetic techniques, interscalene block or general anesthesia. Since this was an observational-comparative study, where patient information was obtained retrospectively by reviewing clinical records, no letter of informed consent was required.

RESULTS

Seventy subjects were evaluated, 50.00 % (n= 35) undergoing general anesthesia and 50.00 % (n= 35) undergoing interscalene block as the type of anesthesia for shoulder arthroscopy; of the subjects undergoing general anesthesia, 94.30 % (n= 33) used balanced general anesthesia and 2.90 % (n=2) total intravenous general anesthesia. The population presented a mean age of 45.97 years (SD: 16.410, p= 0.192); the subjects submitted to general anesthesia had a mean age of 45.74 years (SD: 14.930, p= 0.292) while the subjects with interscalene block had a mean age of 46.20 years (SD: 17.987, p= 0.385), there was no difference in age by type of anesthesia used (p= 0.908). Table 1 describes the demographic details, comorbidities and perioperative characteristics of the general population and by type of anesthetic used. A statistically significant association was found for the type of comorbidity by type of anesthesia used in the subjects; subjects undergoing general anesthesia presented cardiovascular or cardiovascular-endocrinologic comorbidities compared to subjects undergoing interscalene block (p < 0.001, figure 1). The rest of the demographic and perioperative characteristics did not present statistically significant association with respect to any type of anesthesia used. Distribution type of comorbidity by anesthesia used in the research subjects. *Chi-square test. In 80.00 % (n= 28) of the subjects undergoing interscalene block, interscalene block was achieved on the first attempt, while in 20.00 % (n= 7) of the subjects, the block was successful on the 2nd attempt; the distribution of the anesthetic used for interscalene block is shown in Figure 2; the main anesthetic combination used was ropivacaine with lidocaine in 57.10 % (n= 20) of the cases, followed by ropivacaine with lidocaine and clonidine in 22.90 % (n= 8) of the subjects. Pie chart with distribution of anesthetics used for interscalene block. 14.30 % (n= 10) of the subjects presented some type of postanesthetic complication, where 80.00 % (n= 8) of the subjects underwent general anesthesia and 20.00 % (n= 2) underwent interscalene block, statistically significant distribution (p= 0.040, figure 3); in the

analysis of the type of postanesthetic complication presented, 50.00 % (n= 5) presented pain, with a distribution of 80.00 % (n= 4) for subjects submitted to general anesthesia and 20.00 % (n= 1) for subjects submitted to interscalene block, while the second postanesthetic complication presented in 50.00 % (n= 5) was nausea, with a distribution of 80.00 % (n= 4) for subjects submitted to general anesthesia and 20.00 % (n= 1) to interscalene block, there was no statistically significant association for the type of complication by type of anesthesia used (p= 1.000). Bar graph with distribution of postanesthetic complications by anesthesia used in evaluated subjects. *Chi-square test. Opioid use was present in 100.00 % (n= 70) of the subjects during the 0-6 h post-surgery, finding statistically significant association for the use of fentanyl or remifentanil in combination in subjects undergoing general anesthesia, while subjects undergoing interscalene blockade used fentanyl or remifentanil without another concomitant opioid ($p < 0.001$), the details of the distribution are shown in figure 4. Bar graph with distribution of type of opioid used by type of anesthesia in research subjects. Chi-square test. 8.60 % (n= 6) of the subjects used opioids during the 6-12 h post-surgery., where 66.70 % (n= 4) underwent general anesthesia and 33.30 % (n= 2) underwent interscalene block, distribution not statistically significant (p= 0.393); in the case of the period ≥ 12 h post-surgery, 1.40 % (n= 1) of the subjects used opioids, one subject undergoing general anesthesia, distribution not statistically significant (p= 0.314). Table 2 describes the details of the quantitative results in the general population and by type of anesthesia used for visual analog scale in periods 0-12 h and ≥ 12 h post-surgery, as well as for in-hospital stay.

12 h postoperative AND in-hospital stay in hours in general population and by type of anesthesia. Results described as median (interquartile range) except where indicated□ , whose description is presented as mean (standard deviation). *Statistical tests comparing population by type of anesthesia,ǂ Mann-Whitney U test for independent samples,¥ T test for independent samples. Source: Own research. A statistically significant difference was found for a lower score on the VAS scale 0-12 h post-surgery in subjects undergoing interscalene block ($p < 0.001$, Figure 6); in the case of the VAS assessment ≥ 12 h post-surgery, no statistically significant difference was present (Figure 7). Boxplot graph with distribution of visual analog scale score 0-12 h post-surgery by anesthesia used. **Mann-Whitney U* test for independent samples.

Boxplot graph with distribution of visual analog scale score ≥ 12 h post-surgery by anesthesia used. **Mann-Whitney U* test for independent samples. In the case of in-hospital stay, there was a statistically significant difference for a shorter in-hospital stay in subjects who underwent interscalene block ($p < 0.001$, Figure 8). Boxplot graph with distribution of in-hospital stay in hours by anesthesia used. *T-test for independent samples.

DISCUSSION

There are many techniques to provide adequate anesthesia for shoulder arthroscopy, but general anesthesia and interscalene block are 2 of the most commonly used techniques for this purpose. This study has some limitations, such as the fact that it is a study performed only at the ABC Medical Center, since it may not reflect the reality in other centers where shoulder arthroscopies are performed.

Another important limitation is the fact that it was a retrospective study, and it should also be noted that the analysis of a larger number of patients may yield different results. It was also found that all surgeries with interscalene block were performed under general anesthesia or deep sedation in many cases using airway devices such as laryngeal mask or endotracheal tube. The author concludes that in-hospital time benefits may be derived from a lower requirement for opioids and both halogenated and IV anesthetics in patients with interscalene block + general anesthesia compared to patients who only general anesthesia was provided. The demographic characteristics of both groups were similar in terms of number, sex, ASA classification, surgical side, presurgical diagnosis, and whether or not they had comorbidities, although there was a significant difference in patients with previous cardiovascular (specifically systemic arterial hypertension) and cardiovascular/endocrinological (specifically systemic arterial hypertension + type 2 diabetes mellitus) comorbidity. This may be a factor to take into account for the outcomes measured especially for in-hospital stay since it was not the objective of this study to determine the causes of such stay so it may be a factor to consider for a longer stay in the general anesthesia alone group. The most commonly used pharmacological combination was ropivacaine + lidocaine + dexamethasone, but other mixtures were also performed for the interscalene block + general anesthesia group as shown in Figure 2. This might suggest that the outcome results measured in this study could vary depending on the drugs used for the interscalene block. One of the most frequent posanesthetic complications in shoulder arthroscopy is postoperative pain. It has been described that the use of an interscalene block can significantly reduce this complication, which is reflected in this study. The most commonly used adjuvant opioids to prevent postoperative pain in this study were morphine and oxycodone in the general anesthesia alone group, which may be a field of interest for further studies to clarify whether there is any superior benefit comparing morphine and oxycodone. The use of different types of opioid in the same patient and in the same surgical procedure may also increase the incidence of adverse effects as they share similar mechanisms of action. It was observed that the use of antiemetics in both groups was similar in contrast to what some articles support that there is a lower need for antiemetics in patients who underwent blockade. This may be due to the fact that the interscalene blockade group was not only using the blockade, but also general anesthesia, which may have evened out the patients' conditions in terms of the need for these drugs. Although postoperative pain management in the first 12 hours was significantly better in the interscalene block group (Fig 6), pain after 12 hours was no longer statistically significant (Fig 7), which may be explained by a cessation of the interscalene block effect. It is likely that the use of additional techniques such as the placement of a continuous perfusion catheter at the block site may improve pain after 12 hours and is therefore suggested for further studies. No conclusion can be drawn due to the nature of this study, but further prospective studies are suggested in order to consolidate the premises discussed here.

CONCLUSION

Subjects undergoing interscalene block had a mean in-hospital stay of 14.5 hours, while subjects undergoing general anesthesia had a mean in-hospital stay of 25.7 hours. Subjects undergoing interscalene block had a 43.4 % shorter in-hospital

stay than subjects exposed to general anesthesia. In the 0-12 h postoperative evaluation, the subjects submitted to interscalene block had a median VAS score of 2.0, while the subjects submitted to general anesthesia had a median VAS score of 4.1. Opioid and antiemetic use was present in 100.0 % of the subjects during the 0-6 h postoperative period. The incidence of postanesthetic complications measured in this study in the general anesthesia alone group was significantly higher in the general anesthesia alone group (Fig. 3). Taking into account that general anesthesia was given in both groups, we can conclude that there is an added benefit of using interscalene block to reduce postanesthetic complications. More concomitant opioids were used in the general anesthesia alone group (Fig. 4) with oxycodone and morphine being the most commonly used. The use of antiemetics was similar in both groups (Fig 5). This research suggests that interscalene blockade may provide adequate analgesic control as well as a shorter in-hospital stay compared to balanced general anesthesia alone and may be a better management option for the anesthesiologist if appropriately individualized for each patient.

CONFLICT OF INTEREST

No investigator declares any conflict of interest in the conduct of this research.

BYE 21-25, 1-6, 35-36

REFERENCES

7. Wiley AM, J Older MW. Shoulder arthroscopy Investigations with a fiberoptic instrument *. 1980.
8. Paxton ES, Backus J, Keener J, Brophy RH. Shoulder arthroscopy: Basic principles of positioning, anesthesia, and portal anatomy. Vol. 21, Journal of the American Academy of Orthopaedic Surgeons. 2013. p. 332–42.
9. Gross RM, Fitzgibbons TC. Shoulder Arthroscopy: A Modified Approach. 1985.
10. Skyhar MJ, Altchek DW, Warren RF, Wickiewicz TL, O SJ. Shoulder Arthroscopy with the Patient in the Beach-Chair Position. Vol. 4, Arthroscopy: The Journal of Arthroscopic and Related Surgery. 1988.
11. Wolf EM. Anterior Portals in Shoulder Arthroscopy. Vol. 5, Arthroscopy: The Journal of Arthroscopic and Related Surgery. 1989.
12. Jeong H, Lee SH, Jang EA, Chung SS, Lee J, Yoo KY. Haemodynamics and cerebral oxygenation during arthroscopic shoulder surgery in beach chair position under general anaesthesia. Acta Anaesthesiologica Scandinavica. 2012 Aug;56(7):872–9.
13. Pant S, Bokor DJ, Low AK. Cerebral oxygenation using near-infrared spectroscopy in the beach-chair position during shoulder arthroscopy under general anesthesia. Vol. 30, Arthroscopy - Journal of Arthroscopic and Related Surgery. W.B. Saunders; 2014. p. 1520–7.
14. Brown AR, Ch MBB, Weiss R, Greenberg C, Flatow EL, Bigliani LU. Interscalene Block for Shoulder Arthroscopy: Comparison with General Anesthesia. Vol. 9, Arthroscopy: The Journal of Arthroscopic and Related Surgery. 1993.
15. Andersen NH, Johannsen H v, Sneppen O. Frozen shoulder: Arthroscopy and manipulation under general anesthesia and early passive motion. 1998.
16. Jo YY, Kim HS, Chang YJ, Yun SY, Kwak HJ. The effect of warmed inspired gases on body temperature during arthroscopic shoulder surgery under general anesthesia. Korean Journal of Anesthesiology. 2013 Jul;65(1):14–8.
17. Harris M, Chung F. Complications of general anesthesia. Vol. 40, Clinics in Plastic Surgery. 2013. p. 503–13.
18. Ruiz-Suarez M, Barber FA. Postoperative pain control after shoulder arthroscopy. Vol. 31, Orthopedics. 2008. p. 1130.
19. Rains DD, Rooke GA, Wahl CJ. Pathomechanisms and complications related to patient positioning and anesthesia during shoulder arthroscopy. Vol. 27, Arthroscopy - Journal of Arthroscopic and Related Surgery. W.B. Saunders; 2011. p. 532–41.
20. Jo YY, Jung WS, Kim HS, Chang YJ, Kwak HJ. Prediction of hypotension in the beach chair position during shoulder arthroscopy using pre-operative hemodynamic variables. Journal of Clinical Monitoring and Computing. 2014;28(2):173–8.
26. Chan VWS. Applying ultrasound imaging to interscalene brachial plexus block. Regional Anesthesia and Pain Medicine. 2003;28(4):340–3.
27. Abdallah FW, Halpern SH, Aoyama K, Brull R. Will the real benefits of single-shot interscalene block please stand up? A systematic review and meta-analysis. In: Anesthesia and Analgesia. Lippincott Williams and Wilkins; 2015. p. 1114–29.
28. Spence BC, Beach ML, Gallagher JD, Sites BD. Ultrasound-guided interscalene blocks: Understanding where to inject the local anaesthetic. Anaesthesia. 2011 Jun;66(6):509–14.
29. Borgeat A, et al. Interscalene Brachial Plexus Block – Landmarks and Nerve Stimulator Technique [Internet]. 2022 [cited 2022 Jun 20]. p. 1–1. Available from: https://www.nysora.com/techniques/upper-extremity/intescalene/interscalene-brachial-plexus-block/
30. Hussain N, Goldar G, Ragina N, Banfield L, Laffey JG, Abdallah FW. Suprascapular and interscalene nerve block for shoulder surgery: A systematic review and meta-analysis. Vol. 127, Anesthesiology. Lippincott Williams and Wilkins; 2017. p. 998–1013.
31. Boezaart AP. Continuous interscalene block for ambulatory shoulder surgery. Best Practice and Research: Clinical Anaesthesiology. 2002 Jun;16(2):295–310.
32. Hughes MS, Matava MJ, Wright RW, Brophy RH, Smith M v. Interscalene Brachial Plexus Block forArthroscopic Shoulder Surgery. J Bone Joint Surg Am [Internet]. 2013;95:1318–42. Available from: http://dx.doi.org/10.2106/JBJS.L01116
33. Tetzlaff JEYHJ. Interscalene Brachial Plexus block for shoulder surgery. 1994;
34. Mian A, Chaudhry I, Huang R, Rizk E, Tubbs RS, Loukas M. Brachial plexus anesthesia: A review of the relevant anatomy, complications, and anatomical variations. Vol. 27, Clinical Anatomy. 2014. p. 210–21.
37. Jeng CL, Torrillo TM, Rosenblatt MA. Complications of peripheral nerve blocks. British Journal of Anaesthesia. 2010 Dec 1;105:i97–107.
38. Cohen JM, Gray AT. Functional deficits after intraneural injection during interscalene block. Regional Anesthesia and Pain Medicine. 2010;35(4):397–9.
39. Borgeat A, Ekatodramis G, Kalberer F, Benz C. Acute and Nonacute Complications Associated with Interscalene Block and Shoulder Surgery A Prospective Study [Internet]. Vol. 95, Anesthesiology. 2001. Available from:

http://pubs.asahq.org/anesthesiology/article-pdf/95/4/875/403923/0000542-200110000-00015.pdf

40. María D, Serratos-Vázquez C, Fernando Ortega-Torres A. Anestesiología Anestesiología Complicaciones en la anestesia de plexo braquial. Vol. 30, Supl. 2007.
41. Urmey WF, Mcdonald M. Hemidiaphragmatic Paresis During Interscalene Brachial Plexus Block: Effects on Pulmonary Function and Chest Wall Mechanics. 1992.

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