Assessment of the effect of local versus general anesthesia on the pain perception after inguinal hernia surgery

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Abstract

Background: The aim of this study is to compare pain score and complications of local and general anesthesia in surgical treatment of inguinal hernia

Methods: 100 patients with inguinal hernia were selected. In the LA (local anaesthesia) group (n=50) morphine (0.1-0.2 mg per kg) was injected initially for premedication before herniorraphy was performed with local anesthesia by 1% lidocaine. In the GA (general anaesthetic) group (n=50), after premedication, the operation was performed under general anaesthesia. Major complication such as vasovagal reflex, drug reaction, operation time, pain score, local and general complication and lengh of stay in hospital were evaluated.

Results: The operation time was similar between groups, but the length of stay was one day in the LA group and up to five days in the GA group. Vasovagal reaction was seen in 2 percent of LA cases and in 4 percent of the GA group. The 4 hour post operative visit pain score was 2.5±1.3 in LA cases and 6.9±1.8 in the GA group ($p<0.0001$) but the 8 hour post operative visit pain scores were similar in both groups (6.66.6±1.3 and 6.4±1.5 respectively).

Conclusion: Local anaesthesia for inguinal hernioplasty offers a reduction in early postoperative pain and a reduction in length of stay when compared to general anaesthesia.

Keywords: Local anesthesia, Postoperative complications, postoperative pain, inguinal hernia.

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Introduction

Inguinal hernia repair is one of the most common day surgical procedures performed in men, but the optimum method of anesthesia/analgesia in these patients remains unclear [1–2]. Groin hernia repair under local anaesthesia is cost-effective and safe [3–7], but within our country, it is not routinely used in all surgical centres. In this study, we compared local and general anesthesia in patients with groin hernia looking at the outcome measures of complications, post-operative pain and length of stay.

Methods

Male adult patients (n=100) scheduled for primary unilateral inguinal repair were recruited for this study from May 2006 until May 2007. Exclusion criteria were: age less than 20 years, allergy to local anesthetics, recurrent hernia, psychiatric or neurological disease, femoral hernia, renal or hepatic insufficiency, anticoagulant treatment and bleeding abnormalities. The study was approved by the regional Ethics Committee. Patients received verbal information about the trial.

Patients were randomly allocated to local (LA) and general (GA) anesthesia groups based on the order of patient admission. In LA group (n=50) patients received Morphine Sulphate (0.1-0.2 mg/kg IV) as premedication. At surgery, field infiltration with 1% Lidocaine (Pasteur Institution Production, Iran) 8-10ml was performed over the proposed incisional site on the lower abdomen. A further 8–10 ml of 1% Lidocaine was infiltrated under the external oblique aponeurosis to achieve ilioinguinal and iliohypogastric nerves block. In the GA group (n=50), after premedication, general anesthesia was induced by Nesdonal (5 mg/kg), Atropine (0.5 mg) and Succinylcholine (1-1.5 mg/kg) and it was maintained with Halothane 0.8-1.5%, NO2 50% and Oxygen. For muscle relaxation, we used Atracurium (0.5 mg/kg, IV). The Lichtenstein tension-free method of inguinal hernia repair was used in both groups and all procedures were performed by the same surgical team. Peroperatively, pulse rates and blood pressure were monitored and a vasovagal reflex was defined as bradycardia and hypotension which was managed with Atropine. Operating time from onset of local infiltration in LA group and anesthesia in GA group to transferring to the recovery room was recorded. Subjective pain assessments were performed 4 and 8 hours after operation by visual analogue 10-point scale (VAS). Post operative pain management was similar in both groups (Morphine Sulphate, PRN). Post operative local (hematoma, seroma, infection) and general (nausea, vomiting, urinary retention, atelectasia and aspiration) complications were also recorded.

All data values were expressed as mean±SD and a probability value of P less than 0.05 was considered significant. Variables such as Intra operative and post operative complications were compared by χ^2 and Fisher's exact tests. We compared quantitative variables, such as operating time and length of hospital stay by t test and VAS values by using Mann-whitney U test. SPSS 15.0 software was used for data analysis.

Results

In this study, 100 patients were enrolled. Table 1 presents the demographic data, including the American Society of Anesthesiologists Classification and operative time. No significant differences were seen between groups. Length of hospital stay was

Table I Demographic and operative data.

	Local anaesthesia	General anaesthesia	P
n	50	50	-
Age(years)	47.56±17.32	49.64±16.34	NS
Operative time(min)	21.7±4.03	23.26±5.2	NS
ASA class I	45	49	NS
ASA class II	55	51	NS

NS = Not significant

1±0.5 days in LA group and 2.5±1.3 in GA groups (P = 0.02).

Intra operative complications

There were no neurological complications in groups. Vasovagal reflex was occurred in 2% of LA versus 4% in GA groups (NS)

Post operative local complications

Hematoma was occurred in 4% of LA and 6% of GA group (NS). Seroma was recorded in 2% of GA group (NS). Wound infection was similar in both groups (2%).

Post operative general complications

Nausea and vomiting were occurred in 2% of GA group. Urinary retention was occurred in 6% of GA group while atelectasis, diagnosed according to post operative early fever was found in 4% of GA group. Aspiration occurred in 2% of GA group. None of these findings were significant.

Post operative pain

VAS values in 4 and 8 hours after operation are shown in Figure 1. At 4 hours postoperatively the VAS was 2.5±1.3 in the LA group and 6.9±1.8 in the GA group (P <0.0001). At 8 hours after operation the VAS was 6.6±1.3 in the LA group and 6.4±1.5 in the GA group (NS).

Discussion

Pain is an important problem after hernia repair and local anaesthesia as an ambulatory procedure is a well-known method for managing post operative pain [8–15]. For many years, inguinal hernia repair has been one of the most common operations worldwide. Yet, there is still no consensus regarding the optimum mode of anaesthesia. General anaesthesia and regional analgesia in a variety of forms such as caudal and lumbar epidural block, ilioinguinal nerve block, wound infiltration, wound instillation and topical administration of local anesthesia [16] have been used with varying success.

Post operative pain in inguinal hernia repair is caused by the activation of cutaneous and subcutaneous receptors of afferent nerve fibers. These fibers are stimulated by tissue trauma during surgery with inflammatory agents released into the wound tissue. In Callesen et al [17] study, there were no significant differences in cumulative pain scores in different surgical techniques for open repair of inguinal hernia.

Our results showed that the use of local infiltration for inguinal hernia repair has substantial advantages over general anesthesia. None of our LA patients required heavy sedation, and fewer post operative complications were occurred these group.

Operating time of surgery with local anesthesia was shorter than GA group. In Nordin study [1], duration of surgery with local anesthesia was significantly longer.

Post operative pain scores differences may be are related to the half-life of Lidocaine with good local anaesthesia maintained at for hours but not at 8 hours. Advantages of local anesthesia have been reported by other authors. In eight randomized studies [18–25], authors compared local anaesthesia with general anaesthesia. Results of two of these studies showed no significant pain difference between groups [19–24].

Sakellaris et al [26] showed that local anaesthetic infiltration with Robivacaine can modulate hypothalamic-pituitary-adrenal axis response. He showed that painful stimulants can cause cortisol and prolactin release and post operative pain.

Toivanen [27] showed that ilioinguinal block lasted 6 hours post operatively, and after that its effect declined as was found in our own study.

Perhaps our most significant finding in terms of ambulatory surgery was the significant difference in length of stay between our LA and GA groups. Most of the LA group returned home the same day, demonstrating an economic advantage for our institution and quality care for our patients.

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