Original Article

COMPARISON OF LOCAL ANESTHESIA AND CONSCIOUS SEDATION WITH SPINAL ANESTHESIA IN VAGINAL RECONSTRUCTIVE SURGERIES

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ABSTRACT

Objective: There are some studies of feasibility and success of vaginal reconstructive surgeries using local anesthesia. The aim of this study was to compare the combination of local anesthesia and conscious sedation with spinal anesthesia for vaginal repair of advanced vaginal prolapse.

Methodology: Thirty-eight patients with vaginal prolapse as a prospective, randomized and case-controlled clinical trial were operated upon during one year period under local anesthesia with intravenous sedation or spinal anesthesia.

Results: Eighteen women underwent colporraphy, or colpocleisis, using local anesthesia with sedation and 20 patients underwent same procedures using spinal anesthesia. Mean age was 42.18±11.10 years (range 27 to 73). No patient was converted to generated anesthesia. None of patients had intra-operative pain scores >1. Incidence of hypotension (0% v.s 55%; p<0.0001), and blood loss (39.17±13.20 v.s 79.00±18.25 ml; p<0.0001) were lower in the study patients. Duration of anesthesia, time of discharge from post-operative anesthesia care unit (PACU) and the first request to analgesia were significantly different in two groups. Average hospital stay was not different (p=0.56). All 38 patients were very satisfied with their anesthesia experience (p=0.62).

Conclusion: Local anesthesia with sedation can be successfully and safely employed for most vaginal reconstructive surgeries with genital prolapse. This technique is associated with minimal homeostasis and rapid recovery and longer postoperative analgesia.

KEY WORDS: Vaginal prolapse, Vaginal reconstructive surgeries, Local anesthesia, Intravenous sedation, Spinal anesthesia.

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INTRODUCTION

Urogenital prolapse is common in women especially after menopause. Traumatization of the ligamentus and fascia and loss of tone in the muscular compartments of the pelvic floor due to aging, obstetric trauma, and chronic increases in intra-abdominal pressure probable to various forms of prolapse, that are presenting as cystocele, rectocele, or uterovaginal prolapse.[1-3] Due to the frequent coexisting relaxations, the most of vaginal reconstructive

surgeries are frequently performed at the same time. Most of these combination surgeries were performed under general (GA) or regional (RA) anesthesia. However, both general and regional anesthesia can cause complications, especially in the elderly and physiologically fragile patients.[3-5]

Local anesthetic infiltration with intravenous conscious sedation is a simple, inexpensive, and safe regimen for pain relief during minimally or more invasive operations. The anesthetic action is rapid, predictable, of short duration and rarely associated with the systemic side effects associated with G.A.Local anesthesia (LA) also is without the effects of sympathetic block associated to spinal anesthesia .[4,5] In addition these procedures are carried out under local anesthesia in the outpatient clinic.[6]

A few studies have been published on vaginal surgery under LA and intra venous (i.v) sedation. Miklos[5] et al performed anterior/posterior colporraphy, and lefort partial colpocleisis under LA in 20 patients with contra indication to GA or RA. In 1996, Ulmmsten[6] and coworkers reported an ambulatory surgical procedure under LA for treatment of urinary incontinence in 75 women. Subsequent studies described the technique and outcomes of vaginal repair of concomitant advanced uterine and vaginal prolapse and stress urinary incontinence under intravenous sedation and L.A.[7-9] Two studies in 2003 by Axelson[10] et al, and Loaurikainen[11] et al included women between the ages of 30-85 demonstrating that LA with iv sedation may also be used successfully for vaginal surgery in all ages. Buchsbaum[12,13] et al reported the advantages of local anesthesia included minimal interference with homeostasis and rapid recovery with patients often bypassing the recovery unit for vaginal reconstructive surgeries. Two studies showed that tension-free vaginal tape (TVT) using LA is safe, effective and minimally invasive option requiring only a short hospital stay.[14,15]

The aim of this study was to report our experience and quality of analgesia obtained for vaginal repair of pelvic organ prolapse (except vaginal hysterectomy) using local anesthetic infiltration and intravenous conscious sedation compared to spinal anesthesia.

METHODOLOGY

Between April 21, 2007, and April 20 2008, after the Medical Ethics Committee and their written concent, 38 patients, aged 27-73 years, and ASA class I or II, underwent anterior and posterior colporraphy, and colpocleisis using iv sedation with local anesthetic infiltration or spinal anesthesia. All patients complained of severe pelvic pressure and three complained of stress urinary incontinence. All cases underwent preoperative assessment including comprehensive history, general physical examination, and cough stress test. At the time of the preoperative visit, informed surgical consent was obtained and patients were counseled about the options for anesthesia; G.A, RA, and LA with sedation. The advantages of LA are including shorter recovery period, less postoperative nausea and vomiting, no soreness of throat, and less immediate urinary retention on the day of surgery. Patients received prophylactic antibiotics, and sedation (diazepam, 5 mg orally), 30 minutes preoperatively. The patients were then transferred to the operative room and placed in the dorsal-lithotomy position. Intravenous hydration (500-750 ml crystalloid solution) was started, and the vagina and perineum were examined to confirm both the diagnosis and selection of surgical procedure.

Patients were enrolled in two groups randomly by a computer-generated randomization. Of the 38 patients, 18 underwent LA with sedation (study group) and 20 underwent spinal anesthesia (control group). In the study patients sedation was established by the anesthesiologist prior to injection of local anesthetic by surgeon. Sedation was included fentanyl 2ìg/kg and midazolam 0.05mg/kg initially by intravenous bolus. If failed to maintain adequate anesthesia, a continuous intravenous infusion of propofol 2-4 mg/kg/min was initiated. After 5 minutes, local anesthetic infiltration (1.5% lidocaine with 1/200,000 epinephrine) at the vaginal wall defects was performed sub-mucosally.

The amount of sedation required depended on the patient's weight, desired level of awareness, and duration of surgery. The amount of lidocaine based on the duration of surgery and on the limiting dose for it, which is 3 mg/kg of body weight (maximum dose, 300 mg). Submucosal infiltration was performed using a 22-guage needle. The local anesthetic was injected radically to the lateral extent of the defect. If multiple procedures were performed during one case, each surgical site was injected just prior to incision at that site. In the control group, spinal anesthesia was performed by using of 0.5% bupivacaine 3 ml (15 mg) plus epinephrine 1/200,000 using a 25-guage spinal needle. Anterior and posterior colporraphy and colpocleisis were performed in a conventional manner. The surgeries were performed by four different surgeons. All patients had a spontaneous respiration throughout operation.

Pain scores on a numerical analog scale (NAS; 0=no pain, 3=worst pain imaginable) were assessed during operation. When the patient had a NAS >2, LA was converted to G.A.

Monitoring during anesthesia consisted of continuous heart rate (HR) and o2 saturation (spo2), non-invasive blood pressure (NIBP), and electrocardiography (ECG). Hemodynamic parameters changes from >30% of base value was treated by atropine 0.5 mg to maximum dose 2 mg and ephedrine 5 mg to maximum dose 50 mg for treatment decreases HR and BP respectively. Sedation level was evaluated by Ramsay[4] et al scoring. "Operation time" is defined as when the surgeon initiated the operation and ended with the last suture placement. "Anesthesia time" is defined as when the anesthesiologist initiated the sedation (in the study patients), or spinal anesthesia (in the control patients) and ended with the patient discharge from post-anesthesia care unit (PACU). Other information consisted of estimated blood loss, intensity of pain immediately postoperative, time of discharge from PACU, length of hospital stay, and overall satisfaction with anesthesia.

The SPSS 14.0 program (SPSS Inc., Chicago, IL) was used to analyze the statistical data. Data were compared using student *t* test and chi-square test. $p < 0.05$ was considered statistically significant.

RESULTS

A total of 38 patients underwent vaginal reconstructive surgeries in a year. Eighteen patients underwent surgery using local anesthesia and conscious sedation, and in the 20 other patients were operated under spinal anesthesia. There were 35 anterior and posterior colporraphy and three colpocleisis. Any of patients did not need to general anesthesia.

The mean age of patients was 42.18±11.10 years, with range 27 to 73 years. There was no statistical difference between two groups as regards age, weight, ASA class, type and duration of surgery (Table-I).

Intra-operative findings are listed in Table-II. None of the patients had intra-operative pain

Table-I: Demographic characteristics of two groups

	Study Group (n=18)	*Control Group (n=20)*	*P value*
Age (year)	45.67±13.07	41.80±7.92	0.28
Weight (kg)	66.72±7.71	65.50±6.16	0.59
ASA class (I/II/III)	13/3/2	14/4/0	0.38
Operation time	50.83±10.00	56.40±12.1	0.07
Cause of surgery (%)			0.54
cystocele-rectocele	15(83.33)	17(85)	
uterine prolapse	3(16.66)	3(15)	
Type of surgery (%)			0.54
colporraphy	15(83.33)	17(85)	
colpocleisis	3(16.66)	3(15)	

Values are mean ±SD.

Table-II: Intra-operative parameters in two groups

	Study Group (n=18)	*Control Group (n=20)*	*P value*
Sedation level (I/II/III)	0/14/4	0/18/2	0.09
Intravenous fluid (ml)	1027.77±174.23	1752.50±181.71	<0.0001
Intra-operative side effects (%)			
nausea-vomiting	0(0)	3(12)	0.003
Hypotension	0(0)	11(55)	<0.0001
Intra-operative pain (%)			0.04
0	15(83.33)	20(100)	
1	3(16.66)	0 (0)	0(0)
2	0(0)	0(0)	
3	0(0)	0(0)	
Intra-operative treatments			
ephedrine (mg)	0.00	3.50±3.28	<0.001
metoclopramide (mg)	0.00	0.50±1.53	<0.001
propofol(mg)	57.22±38.01	0.00	<0.001
lidocaine(ml)	11.78±1.89	0.00	<0.001

Values are mean ±SD.

score > 1, so local anesthesia or spinal anesthesia was not converted to general anesthesia. Propofol with a mean dose of 57.22±38.01 mg was used as supplement to sedation in the study group and an average of local anesthesia was 11.87±1.89 ml in these patients. All patients in two groups were in the sedation level of II-III throughout procedure. None of study group experienced intra-operative nausea, but 3 (12%) patients of control group had nausea intra-operatively (p=0.003). Mean estimated blood loss was lower in the study group (39.17±13.20 ml vs 79.00±18.25ml; p<0.0001). Average intravenous fluid, ephedrine, and metoclopromide consumption was lower in study patients (p<0.0001 for each parameters).

Mean of heart rate (HR) changes were not significantly different between two groups throughout anesthesia, but hypotension was higher in control group (p<0.0001; Fig-1).

Postoperative outcomes are listed in Table-3. Most of study patients were admitted directly to the floor bypassing the PACU (mean length 4.88±1.23 min) but mean length of stay at PACU in the control group was 51.25±11.57 min (p<0.0001). Therefore, duration of anesthesia in

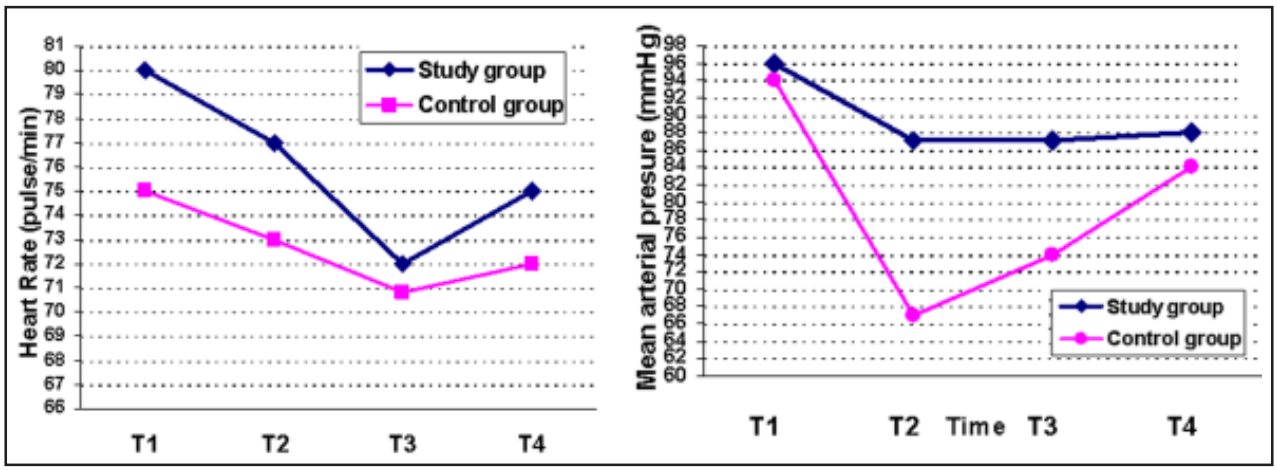

Fig-1: Hemodynamic changes in two groups.T1=base measure,
T2= 3 min after induction of anesthesia, T3= end of surgery, T4= PACU

the control group statistically was longer than the study patients (p<0.0001). Postoperative pain score was lower in study patients (p<0.0001) and the first request to analgesia was longer in the study group (132.11±37.54 v.s 34.90±5.54; p<0.0001). All patients in the two groups were discharged within 42 hours of surgery (p=0.56).

All the patients of two groups were very satisfied with the method of anesthesia during their operation, and there was no significant differences between two groups (p=0.62). Only 3(16.66%) patients of study group reported to experience mild pain during the posterior colporraphy (p=0.04).

DISCUSSION

All anesthesia methods have the potential for risks and complications. General anesthesia is known to have potentially detrimental effects on the cardiovascular, respiratory, gastrointestinal and the central nervous systems, where it has been found to cause postoperative transient confusional status in more than half of all elderly patients[3-5]. Regional anesthesia is associated with physiologic effects and side effect perioperatively. In addition, it is contraindicated in the coagulopathies.[3,4]

A few studies have been published on vaginal surgery under local anesthesia with intravenous sedation. Most of these studies were retrospective, and they have been reported in the elderly patients undergoing anterior and posterior colporraphy and lefort type colpocleisis.[5-13]

This randomized and case-controlled clinical trial was performed by local anesthesia with sedation in the vaginal reconstructive surgeries compared to spinal anesthesia. The patients had a range age of 27-73 years. This shows, local anesthesia with sedation may be considered an alternative to GA or RA for vaginal reconstructive surgeries in women of all ages. Buchsbaurn[12] et al were revealed this method of anesthesia can be successfully employed for younger women.

The study patients had a pain score 0-1 during procedure, that shows the sedation with LA safely and successfully can use for vaginal reconstructive surgeries.[5-15]

Incidence of hypotension was lower in the study patients, because LA is not associated with hemodynamic disturbance.[3-5] Therefore; the need to ephedrine for treatment of hypotension was lower in these patients. Blood lose was less in the study patients, that is may be due to using epinephrine with lidocaine. Jomaa[8] et al showed that intra-operative bleeding was low in patients when their operation was performed under local anesthesia.

The patients of the study group bypassed the PACU and admitted directly to the floor. LA

Table-III: Postoperative outcomes in two groups

	Study Group (n=18)	*Control Group (n=20)*	*P value*
Time of discharge from PACU(min)	4.88±1.23	51.25±11.57	<0.0001
Post-operative pain (%)			<0.0001
0	14(77.77)	3(15)	
1	3(16.66)	4(20)	
2	1(5.55)	13(65)	
3	0(0)	0(0)	
First request to analgesia (min)	132.11±37.54	34.90	<0.0001
Hospital stay (hr)	39.72±2.84	39.15±3.19	0.56
Overall patient satisfaction (%)			0.62
Excellent	14(77.77)	20(100)	
Satisfactory	4(22.22)	0 (0)	
Fair	0(0)	0(0)	
Unsatisfied	0(0)	0(0)	

Values are mean ±SD.

can reduce anesthesia side effects and eliminates the need for PACU time required for patients to emerge from GA or regress motor block with R.A. Thus allowing for more efficient operating room turnover, and costs are saved when patients bypass the PACU[12].

The patients of the study group did not have postoperative pain immediately after surgery. Duration of lidocaine for the nerve blocks is longer than spinal anesthesia.[4] Duration of analgesia is prolonged significantly when epinephrine is added to the lidocaine.[4,5]

The patients can be discharged earlier within 24 hours of surgery. The majority of our patients of two groups had bladder catheter, so the patients were discharged home withen 24-45 hours of surgery.

All the patients were satisfied with their anesthesia experience. This type of anesthesia regarded to effectiveness of analgesia during procedure. Early ambulation, earlier home discharge, and high level of satisfaction were reported by patients.[5-15]

In conclusion, the results of this study demonstrate the vaginal reconstructive surgeries can be performed safely and successfully with local anesthesia and sedation for all patients in all ages. This study illustrates this technique is associated with limiting the potential risks of RA and a need of short time postoperative observations, low postoperative complication rate, and high level of satisfaction reported by the patients.

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