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Efficacy of perianal nerve block for day care ano-rectal procedures

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Abstract

Aim of this study was to assess patient safety, comfort, satisfaction level and quality of anaesthesia in patients undergoing day care ano-rectal procedures performed under Perianal Nerve Block (PNB) in comparison with Spinal Anaesthesia (SA) in peripheral medicare settings. The study was a prospective, single centre study performed over a period of two years on 65 patients scheduled for various day care ano-rectal procedures. The patients were randomized to receive PNB or SA. The PNB was established using a mixture of 20ml of 2% lignocaine Hydrochloride (plain) and 20ml of 0.5% Bupivacaine Hydrochloride (plain) by four point perianal injection with Perianal subcutaneous infiltration augmentation technique whereas in all SA patients, the spinal block was established using 2 ml of 0.5% Bupivacaine (heavy) using 25G spinal needle in sitting position. All patients received premedication in the form of Inj Glycopyrrrolate 0.2mg/iv and Inj Ondansetron 8mg/iv. Patients were thereafter evaluated for pain and discomfort during the establishment of anesthesia, per-operatively and postoperatively for three days using a 10 point Visual Analogue Scale (VAS) and patient satisfaction level (1-5 point score). A total population of 65 patients out of 90 was found eligible for the study and were divided into two groups to either receive spinal anaesthesia (SA group, n=33) or Perianal nerve block (PNB group, n=32). Mean VAS during establishment of nerve block was 3.625 in PNB group and 1.2424 in SA group. Intra-operatively, VAS score was not very significantly variable in both the study groups. Mean VAS for post-operative pain during initial 12 hrs was 2.437 in PNB group and 5.878 in SA group. (P<0.0001). 15.62% patients experienced complications in PNB group whereas 57.57% in SA group. Overall Satisfaction level was 3.875 in PNB group whereas 3.061 in SA group. Perianal Nerve Block is an easy to establish anaesthesia technique with limited resources in a peripheral hospital vis-a-vis spinal anaesthesia with less complications and more patient satisfaction.

Keywords: Perianal nerve block, spinal anaesthesia, anorectal surgeries, pain relief, satisfaction

Introduction

Ano-rectal procedures are now a day, commonly performed surgeries in majority of the operation theaters. Most of these cases are chronic in nature and comprise of Hemorrhoids, Fistula-in-ano, Anal fissure, Perianal sinus, Polyps, Warts, Skin tags, Pilonidal sinus, etc. Surgical treatment assures the patient a better quality of life [1]. Since the inception of Day care concept at University of Carolina, Los Angeles in 1962, approximately 90% of such disorders are operated in ambulatory settings. [2]. To qualify for day care surgery, the patient needs to be discharged from the hospital within 24 hours without any residual anesthetic effect. Post-operative pain relief and satisfaction of the patients in ambulatory setting has always been the primary goal worldwide. The Spinal anaesthesia (SA) and General anaesthesia (GA) techniques

continue to be the gold standard in the management of such cases but the associated complications necessitated for continuous search of an alternative and better technique of anesthesia. Various local anaesthetics (LA) have been used by anaesthesiologists and surgeons for short localized procedures with fewer risks and complications. The Perianal nerve block (PNB) is one of the local anaesthesia techniques that can be used as an alternative for these surgeries [3-5]. This study compares between the use of PNB technique and SA in terms of analgesic efficacy, post-operative pain relief, hospital stay and overall patient satisfaction.

Material and Method

This was a prospective single centre study performed over a period of two years from Jan 2015 to Dec 2016, after approval from institutional ethics committee (Approval no: 164/11/02). Sample collection involved a simple randomized sampling of patients without stratification. Based on the exclusion criteria (Table 1), 90 patients were scheduled for various day care procedures, of

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which 25 patients were lost to follow up. As per registration every even number patient was subjected to PNB group and odd number patient to SA group.

The material comprised of 2% Lignocaine hydrochloride without Adrenalin plus 0.5% plain Bupivacaine hydrochloride, 20 ml each for PNB given with 30mm 22G hypodermic needle, and 2.0 ml of 0.5% Bupivacaine Hydrochloride (Heavy) used for SA using 25G Quincke's needle (Romsons). Patients were allowed to take sips of clear fluid upto 2 hours prior to surgery. Written informed consent was taken. All patients received intravenous (IV) antibiotics i.e. Ciprofloxacin and Metronidazole 02 hours prior to the procedure followed by Inj Ondansetron 8mg (IV) 30 minutes prior to surgery.

Patients were placed in lithotomy position on operating table offering excellent access to the peri-anal region and positional comfort to the patients. With 30mm, 22G hypodermic needle 5ml PNB solution was infiltrated 1.5 cm lateral to anal mucocutaneous junction at 3, 6, 9 and 12 O'clock positions. The needle was inserted on above mentioned positions to its full depth in cephalad direction, angled 5-8 degrees lateral to anorectal canal and LA was slowly infiltrated while gradually withdrawing the needle. The needle was thereafter bent into a half circle and inserted subcutaneously, 1.5 cm lateral to anal mucocutaneous junction at 3 O'clock position circumferentially in anterior and posterior directions reaching up to 6 and 12 O'clock positions, infiltrating 05 ml of LA mixture while gradually withdrawing the needle. This curved needle infiltration was similarly repeated at 9 O'clock position establishing complete perianal region anesthesia. The quality of block was assessed after 10 minutes by needle prick and the surgical procedure carried out.

In SA group, anesthesia was established by injecting 2ml of 0.5% Bupivacaine (Heavy) at the level of L3-4, using 25G Quincke (Romsons) spinal needle in sitting position under strict asepsis. Thereafter, the patients were placed in lithotomy position and quality of block assessed prior to surgery. In case of block failure, rescue anaesthesia 1 mg/kg Inj Ketamine (IV) was used. All operative methods were conventional and included Hemorrhoidectomy by Morgan-Milligan or Ferguson technique for grade III and IV hemorrhoids, Fistulectomy for fistula-in-ano, open lateral sphincterotomy for fissure-in-ano, excision for polyp, warts, skin tag and perianal sinus.

All patients were monitored for non-invasive blood pressure, heart rate, pulse oximetry, ECG and signs of local anaesthetic toxicity. Less than 1000 ml fluid (Lactated Ringer's solution) was infused throughout the procedure in OT. On completion of the surgical procedure, the wound was dressed with an anal pack and T-bandage. Patients were observed in the recovery room for one hour and then shifted to the ward. All patients were kept supine position for 6 hours from the establishment of anaesthesia/block. Postoperatively, patients were continued on oral antibiotics for three days and Injection Diclofenac Sodium 75 mg intramuscularly (IM) was administered as rescue analgesia for breakthrough pain when in hospital. The post-operative complications were observed and patients' "home readiness" assessed with modified Post Anaesthesia Discharge Scoring system (PADSS) [6]. All patients were evaluated for pain and discomfort during the establishment of anesthesia (T1), during surgery (T2) and postoperatively at 6

hours (T3a) and 12 hours (T3b), 24 hours (T3c) and 03 days (T3d) by telephone, using a 10 point Visual Analogue Scale (VAS).

Statistical Analysis

All data generated from the study was analyzed statistically to compare both qualitative and quantitative variables (pain during establishment of anesthesia and conduct of surgery, postoperative pain up to 6 hours, 12 hours, 24 hours and 03 days, duration of surgery, hospital stay and complications encountered). Unpaired t-test (student's t-test) and Mann-Whitney U test was used for continuous data. Chi-square test was used for categorical data. Qualitative variables of level of satisfaction between the two groups were compared as numbers and percentage. The demographic data was described as values in mean or absolute number with percentage. In this study, the data analysis was considered statistically significant if p-value was <0.05.

Table 1. Exclusion Criteria

Exclusion Criteria	
1	ASA III and above
2	Acute Infections in the Perianal Region
3	Ano-rectal carcinoma
4	Inflammatory Bowel Disease
5	High up fistula-in-ano
6	Coagulopathies
7	Age less than 12 years
8	Spinal deformities
9	Documented history of allergy to local anaesthetics
10	NYHA III & IV patients
11	Patients not accompanied by attendants on day of surgery
12	Patient refusal for the procedure or the allocated anaesthetic technique

Results

A total population of 65 patients out of 90 was found eligible for the study and were divided into two groups to either receive spinal anaesthesia (SA group, n=33) or Perianal nerve block (PNB group, n=32). There were almost equal number of males and females in both the groups. The demographic data is described in the table 2.

The Assessment of Pain is presented in Table 3. 31 patients out of 32 receiving PNB had an adequate analgesia within 10 minutes after administration of drugs, only one patient experienced inadequate block and required additional sedation for the completion of procedure. This may also be attributable to performer error. However, no patient required conversion to SA or GA. Duration of hospital stay is shown in table no 4.

Nineteen patients (57.57%) in the SA gp experienced complications (like urinary retention, spinal headache, primary hemorrhage, etc.) whereas only five patients (15.62%) in the PNB gp developed the complications (Table.5).

The level of satisfaction (Table.6) was assessed and compared among both the study groups.

The overall satisfaction of the subjects with the surgery and anaesthesia was comparable in both the groups with PNB having an edge over SA.

Table 2. Patient's demographic data

Age groups		Type of Anaesthesia			
		SA (n=33)	PNB (n=32)		
		Mean (SD)/ Number (percent)	Range	Mean (SD)/ Number (percent)	Range
1	Age (years)	36.64/(11.22)	15-75	35.88/(11.12)	21-65
2	Gender (Male/Female)	25(76%)/08(24%)		28(87%)/04(13%)	
3	ASA (I/II)	20(61%)/13(39%)		22(69%)/10(31%)	
4	Weight (Kg)	65.94/(6.89)	46-80	66.94/(7.65)	58-85

Values are mean (SD) or absolute number (percent)

Table 3. Assessment of Pain

PAIN LEVEL (VAS=1-10)		SA (n=33)	PNB (n=32)	p-value
		Mean VAS (SD)	Mean VAS (SD)	
1.	Pain during establishment of Anaesthesia (T1)	1.2424(0.4351)	3.625(0.7071)	p=0; significant
2.	Pain during surgery (Intra-operative Pain) (T2)	1.212(0.4151)	1.406(0.4989)	p=0.18024; not significant
3.	Post-operative Pain (upto 6 hours) (T3a)	1.787(0.5998)	1.531(0.5070)	p=0.13888; not significant
4.	Post-operative Pain (upto 12 hours) (T3b)	5.878(0.9603)	2.437(0.5644)	p=0; significant
5.	Post-operative Pain (upto 24 hours) (T3c)	5.696(0.8095)	3.031(0.8974)	p=0; significant
6.	Post-operative Pain (after 03 days) (T3d)	2.484(0.9394)	2.031(0.7822)	p=0.07186; not significant

Table 4. Duration Of Surgery and Hospital stay

		Type of Anaesthesia		p-value
		SA (n=33)	PNB (n=32)	
		Mean (SD)	Mean (SD)	
Duration Of Surgery (Minutes)	20.818(6.894)		20.625(14.410)	p=0.9450; not significant Un paired t-test
Duration of Hospital Stay (Hour)	17.242(3.792)		9.313(3.45)	p=0; significant

Table 5. Complications

		Type of Anaesthesia		p-value
		SA (n=33)	PNB (n=32)	
Complications	19(57.57%)		5(15.62%)	p=0.0158; significant

Table 6. Assessment of Pain

LEVEL OF SATISFACTION (SCORE = 1-5)		Type of Anaesthesia	
		SA (n=33)	PNB (n=32)
		Mean (SD)	Mean (SD)
1.	Unsatisfied(US: up to 01)	2(6.06%)	2(6.25%)
2.	Fairly Satisfied (FS:1 to 2)	2(6.06%)	4(12.5%)
3.	Satisfied (S:2 to 3)	23(69.69%)	22(68.75%)
4.	Very Satisfied (VS:3 to 5)	6(18.18%)	4(12.5%)
5.	Overall Satisfaction	3.061(0.827)	3.875(0.707)

Discussion

Different methods have been adopted for enhancing patient comfort and acceptance of the surgical procedure. Sub mucosal technique of infiltration to reduce the pain experienced during injection in perianal block was also described. Sedation was observed to allay anxiety by RS Bharathi et al, if used prior to PNB but was not seen useful in young patients (less than 35 years of age) [4]. In order to study the effect of PNB as sole anesthetic technique, none of the above methods except pre-op counseling were incorporated in our study. Hence pain during establishment of anesthesia was

found to be significant ($p < 0.0001$, $p = 0$). Major thrust was given to preoperative counseling about the procedure and postoperative outcome which helped in gaining the patient confidence and lowered apprehension levels. The intensity of pain was observed to be reduced in pre-operatively counseled patients [7]. Pain during establishment of anesthesia in PNB group was found to be higher in comparison with SA group in our study. PNB eliminated pain in the recovery period more effectively than SA, as is evident from this study in which mean VAS in PNB group up to 6 hours and 12 hours was 1.53 and 2.43 respectively when compared to 1.787 and 5.878 in SA group.

Studies have shown that postoperative pain is subjective and patients satisfaction was unrelated to severity of pain, though many may not wish to complain. Philip BK in his study expressed existence of contributory factors other than pain towards patient satisfaction [8]. However, postoperative pain has dramatic effect on recovery, thereby, reflecting on to the hospital stay. This was evident in our study too, as we achieved good postoperative analgesia in both the groups in initial 6hrs ($p=0.18024$ /not significant), but gradually within the next 12 hrs and up to 24hrs PNB out passed its benefits over SA significantly because of which 78.2% could be discharged in less 10hr from the time of operation whereas in SA only two patients were satisfied who could be discharged in less than 10hr. Our findings also corroborated with similar studies[9,10].

Urinary retention probably due to vesical dysfunction and altered micturition reflex has been observed to be another common complication in anorectal surgery patients undergoing SA [10-12]. As low as 15% patients under spinal anesthesia had this complication in our study, probably due to use of low doses of hyperbaric bupivacaine solution and minimal amount of intravenous fluid. Only two patients reported with wound infection, one presented with primary hemorrhage as perianal hematoma. Thus less than 10% of patients in PNB reported with complications after discharge. All the complications were managed on outpatient basis and did not require admission. Post-operative Complications were significantly less in PNB group than SA group. Nineteen patients (57.57%) in the SA gp experienced complications (like urinary retention, spinal headache, primary hemorrhage, etc.) whereas only five patients (15.62%) in the PNB gp developed the complications (Table.5). However all complications were conservatively managed in both gp. The comparison was found to be significant ($p= 0.0158$) and confirmed that PNB technique compared to SA, is definitely associated with less number of post-operative complications.

The level of satisfaction as shown in (Table.6) was assessed and compared among both the study groups and it was observed that, 69% of subjects in both groups were satisfied, 12% of subjects in PNB gp were fairly satisfied in comparison to 6% of subjects in SA gp, 18% of subjects in SA gp were very satisfied compared to 12% in PNB group. 6% of subjects were not satisfied with any of the techniques of the study. The overall satisfaction level in both the study groups was almost equivalent though, slightly more in PNB group

Conclusion

PNB is an easy to establish and safe to practice anaesthesia technique, which can even be mastered by the surgeons and practiced as a sole anaesthetic technique in facilities with limited medical resources. It also confirmed that PNB, has advantages of considerable reduction in postoperative pain, less analgesic requirements, short hospital stay, lesser number of complications and higher level of patient satisfaction in comparison with spinal anaesthesia in patients undergoing day care ano-rectal procedures. However, further research is still warranted to achieve standardization of the technique.

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