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# EFFECT OF ADJUVANT PUDENDAL NERVE BLOCK IN POST-OPERATIVE PAIN FOLLOWING PERIANAL SURGERY FOR NON-SUPPURATIVE CONDITIONS

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**Abstract**

***Objectives:*** *To determine the effect of adjuvant "pudendal nerve block" in post-operative pain following perianal surgery for non-suppurative conditions.*

***Study design:*** *Quasi-experimental study.*

***Place and duration of study:*** *"Nov 24 to April 25,CMH Abbotabad*

***Methodology:*** *66 patients who were planned to undergo elective perianal surgery were included in the study and were divided into "Pudendal nerve block + spinal anesthesia group" and "spinal anesthesia alone group" alternatively in order of presentation. Post-operative outcomes were compared between groups. Data was analyzed by SPSS 20.00.*

***Results:*** *Mean age was 36.94 ± 7.85 years. There were 42 (63.64%) males and 24 (36.36%) females. Mean BMI was 32.71 ± 6.96 kg/m2. Frequency of patients who had requirement of additional post-operative analgesia during 24-hours after surgery in "pudendal nerve block + spinal anesthesia group" was 5 (15.15%) while in "spinal anesthesia alone group" it was 20 (60.61%), (p < 0.001). Frequency of patients who were pain free after 24 hours of surgery in "pudendal nerve block + spinal anesthesia group" was 20 (60.61%) while in "spinal anesthesia alone group" it was 7 (21.21%), (p = 0.001).*

***Conclusion:*** *"Pudendal nerve block" can serve as a highly useful adjuvant to "spinal anesthesia (SA)" in patients who undergo perianal surgeries*

## INTRODUCTION

The utilization of outpatient surgeries offers a viable and economically efficient approach to managing common "non-suppurative perianal disorders," including "hemorrhoids" and "anal fissures," which are commonly encountered in surgical outpatient departments (OPDs). [1] The prevalence of "hemorrhoids" has been estimated to be 4.4% worldwide, while estimates from earlier research suggest that the number may as high as 13% of the general population. [2] Likewise, "anal fistula", a frequent consequence of "anal abscess", is also a prevalent disorder in the perianal region. Previous research has indicated that 15-60% of patients who develop abscess in the perianal region also develop "anal fistulas". [3] Even though these surgeries are frequently underrepresented in medical residency programs, they are among the most frequently done procedures due to the substantial disease burden of these disorders. [4]

Similar to other surgical procedures, "perianal surgeries" necessitate a thorough understanding of the selection of anesthesia for the purpose of minimizing post-operative morbidities, specifically post-procedural pain and mobility, both of which are influenced by various factors. [5] Typically, these surgical procedures are conducted using either short-duration "general anesthesia (GA)" or regional anesthesia, specifically "spinal anesthesia (SA)" and "saddle block anesthesia". These anesthetic options have gained popularity in recent years as preferred choices for anesthesia in such surgical procedures. [6, 7] Another such option of regional anesthesia that is considered highly useful for day-care or ambulatory "perianal" surgical procedures is "perianal block". [8, 9] In recent times, surgeons conducting ambulatory perianal surgeries have incorporated an alternative method of anesthesia alongside "spinal anesthesia (SA)". This method is known as the "pudendal nerve block", wherein the anesthetic agent is locally administered in the perianal region to impede the transmission of signals from the "pudendal nerve". [10] Its use in conjunction with "spinal anesthesia (SA)" has been hypothesized to provide better outcomes in terms of sustained pain relief after the surgery for longer duration and particularly with the potential to avoid excessive use of analgesics (like NSAIDs and opioids). [10] However, when it comes to its use alongside the conventional "spinal anesthesia (SA)" as a standard practice, there is a lack of consensus of surgeons. Keeping in view such major potential advantages of adjunctive use of "pudendal block" with "spinal anesthesia (SA)" [10], present study was conducted with the aim of determining the effect of adjuvant "pudendal nerve block" in post-operative pain following perianal surgery for non-suppurative conditions.

## METHODOLOGY

This "quasi-experimental study" was conducted at "CMH Abbotabad, Nov 24 to April 25". Appropriate sample size was calculated using following formula:

For calculations, following assumptions were used; "level of significance of 5%", "power of 90%", "anticipated frequency of requirement of post-op analgesia in pudendal nerve block + spinal anesthesia group" of 9.09% and "anticipated frequency of requirement of post-op analgesia in spinal anesthesia alone group" of 43.33%. [10] This gave a sample size of 66 (33 in each group).

$$n = \frac{\left\{ z_{1-\alpha/2}\sqrt{2\bar{P}(1-\bar{P})} + z_{1-\beta}\sqrt{P_1(1-P_1)+P_2(1-P_2)} \right\}^2}{(P_1-P_2)^2}$$

**Inclusion criteria:** Patients who had the age ≥ 18 years, both males and females, ASA status I and II, who were scheduled to undergo perianal surgeries under "spinal anesthesia (SA)" were included in the study.

**Exclusion criteria:** Patients with age younger than 18 years, those who had history of hypersensitivity to anesthesia drugs, "American society of Anesthesiology (ASA)" status ≥ III, those who had phobia of undergoing surgery while being conscious and those who were unfit for surgery were excluded from the study.

Patients were selected by using "non-probability consecutive sampling technique". Baseline characteristics of the patients including age (in years), gender, BMI (in kg/m2), ASA status, co-morbidities and type of perianal surgery (hemorrhoidectomy/lateral internal sphincterotomy/fistulotomy/fistulectomy) were documented. Prior to being included in the current study, it was mandatory to sign an informed consent proforma. After the completion of a comprehensive pre-anesthetic assessment conducted as per institution protocol (which included blood testing, virology screening, basic radiography, and electrocardiography), patients were alternatively assigned to one of two anesthesia options based on their order of presentation with first patient assigned "pudendal nerve block + spinal anesthesia group" and second one assigned to "spinal anesthesia alone group" and so on.

In "spinal anesthesia alone group", the patient was placed in a seated position, and their back was thoroughly cleaned and covered with a drape. The space between L3 and L4 spinal vertebrae was determined using anatomical landmarks and the skin

was rendered numb by injecting 2 ml of "2% lignocaine" solution placed in a 3cc syringe. Subsequently, a "25G Quincke spinal needle" was introduced into the designated spinal space. Once the needle was confirmed to be in the spinal space by visualizing "cerebrospinal fluid (CSF)" expression, 1-2 ml of "0.5% bupivacaine" was injected. The patient was then placed in a supine posture. In "pundendal nerve block + spinal anesthesia group", procedure of spinal anesthesia was similar as mentioned before. Once surgery was completed, patient while being in the "lithotomy" position for the surgery was kept in the same position for "pudendal nerve block". 20ml of "0.2% Ropivacaine" was taken in a syringe which was inserted into the skin just below the "ischial spine" on both sides transperianally and 10ml of solution was injected. After this needle was advanced further by 1 inch through the "sacrospinous ligament" and remaining 10ml of solution was injected at four and eight-o-clock positions.

All the surgeries were performed by the consultant surgeons as per standard techniques. Patients were closely monitored for the first 24 hours after the surgery. During this period, presence of any pain [defined as pain visual analogue scale (VAS) > 1) requiring additional analgesic was documented and for its relief inj. Paracetamol ® 1g IV was given. In case of no relief, additional dose of inj. Tramal ® 50mg IV was given. At the end of 24 hours, proportion of patients who were pain free (defined as pain VAS ≤ 1) was also documented. In addition to this, hospitalization duration was also documented.

"Data analysis was performed using Statistical package for Social Sciences version 20.00. Quantitative data was represented using mean ± standard deviation. Qualitative data was represented by using percentage and frequency. Comparison of qualitative variables between groups was performed using Chi-square test while for quantitative variables, Student t-test was used. A $p \leq 0.05$ was taken as significant".

## RESULTS

In this study, 66 patients (33 in each group) were included. Mean age was 36.94 ± 7.85 years. There were 42 (63.64%) males and 24 (36.36%) females. Mean BMI was 32.71 ± 6.96 kg/m2. 32 (48.48%) patients had ASA status I and 34 (51.52%) had ASA status II. 14 (21.21%) had no co-morbidity, 21 (31.82%) had diabetes, 20 (30.30%) had hypertension and 11 (16.67%) had history of smoking. Most commonly performed perianal surgery was "hemorrhoidectomy" 25 (37.88%) followed by "fistulectomy" 23 (34.85%), "lateral internal sphincterotomy (LIS)" 10 (15.15%) and "fistulotomy" 8 (12.12%). Comparison of baseline characteristics between groups is summarized in tabulated form below in table I:

**Table I: Comparison of baseline characteristics between groups (n = 66)**

| Characteristic | Pudendal nerve block + spinal anesthesia group (n = 33) | Spinal anesthesia group (n = 33) | p-value |
|---|---|---|---|
| **Mean age** | 37.24 ± 8.32 years | 36.64 ± 7.46 years | 0.759 |
| **Gender** | | | |
| Male | 20 (60.61%) | 22 (66.67%) | 0.609 |
| Female | 13 (39.39%) | 11 (33.33%) | |
| **Mean BMI** | 33.86 ± 6.12 kg/m2 | 31.56 ± 7.62 kg/m2 | 0.182 |
| **ASA status** | | | |
| I | 17 (51.52%) | 15 (45.45%) | 0.622 |
| II | 16 (48.48%) | 18 (54.55%) | |
| **Comorbidity** | | | |
| No | 7 (21.21%) | 7 (21.21%) | 0.953 |
| Diabetes | 10 (30.30%) | 11 (33.33%) | |
| Hypertension | 11 (33.33%) | 9 (27.27%) | |
| Smoking | 5 (15.15%) | 6 (18.18%) | |

| | | | |
|---|---|---|---|
| **Type of perianal surgery performed** | | | |
| Hemorrhoidectomy | 13 (39.39%) | 12 (36.36%) | 0.842 |
| Fistulectomy | 10 (30.30%) | 13 (39.39%) | |
| Fistulotomy | 4 (12.12%) | 4 (12.12%) | |
| LIS | 6 (18.18%) | 4 (12.12%) | |

Frequency of patients who had requirement of additional post-operative analgesia during 24-hours after surgery in "pudendal nerve block + spinal anesthesia group" was 5 (15.15%) while in "spinal anesthesia alone group" it was 20 (60.61%), ($p < 0.001$). Frequency of patients who were pain free after 24 hours of surgery in "pudendal nerve block + spinal anesthesia group" was 20 (60.61%) while in "spinal anesthesia alone group" it was 7 (21.21%), ($p = 0.001$). Mean duration of hospitalization in patients of "pudendal nerve block + spinal anesthesia group" was 1.72 ± 0.80 days while in "spinal anesthesia alone group" it was 3.51 ± 0.97 days, ($p < 0.001$). This data is summarized below in table II:

**Table II: Comparison of outcomes between groups (n = 66)**

| Characteristic | Pudendal nerve block + spinal anesthesia group (n = 33) | Spinal anesthesia group (n = 33) | p-value |
|---|---|---|---|
| **Mean duration of hospitalization** | 1.72 ± 0.80 days | 3.51 ± 0.97 days | < 0.001 |
| **Requirement of additional post-operative analgesia** | | | |
| Yes | 5 (15.15%) | 20 (60.61%) | < 0.001 |
| No | 28 (84.85%) | 13 (39.39%) | |
| **Patients pain free after 24 hours of surgery** | | | |
| Yes | 20 (60.61%) | 7 (21.21%) | 0.001 |
| No | 13 (39.39%) | 26 (78.79%) | |



## DISCUSSION

The present study focused on a crucial element of perianal operations, specifically the selection of regional anesthesia for the surgical procedure. In this particular case, a substantial body of prior research has demonstrated that "spinal anesthesia (SA)" is a favored option for anesthesia for various day-care surgical procedures. [11, 12] However, it has been observed in several studies that the adjuvant use of regional and nerve block in "perianal surgeries" may be a more appropriate option compared to solely relying on "spinal anaesthesia (SA)". [13, 14] Therefore, this study focused on determining the effect of adjuvant "pudendal nerve block" in post-operative pain following perianal surgery for non-suppurative conditions.

In present study, average age of the patients who underwent "perianal surgeries" for non-suppurative conditions was thirty seven years and majority of them had male gender which corresponds to the observation made by a number of previous researchers showing that perianal conditions like "hemorrhoids" and "fistula-in-ano" are more common in men who belong to the middle age group. [15, 16] In present study, average BMI of the patients was 37 kg/m2 which falls in the obese category which is in synchronization with the fact that perianal conditions, both "hemorrhoids", "anal fistulas" and "anal fissures" are much more common in patients who are obese and have unhealthy BMI. [17, 18] Most commonly performed surgeries in present study was "hemorrhoidectomy" which is congruent with the fact that it is the most commonly performed surgical procedure across the globe. [19]

In terms of outcome, present study shows that when "pudendal nerve block" is used as an adjuvant with "spinal anesthesia", it significantly reduces the requirement to administer additional analgesia to the patients within the initial twenty four hours of the surgery and the hospitalization duration. In addition, patients who have "pudendal nerve block" in addition to the "spinal anesthesia" for non-suppurative

perianal surgeries, have significantly higher chances to be pain free after 24-hours of the surgery as compared to those operated with spinal anesthesia only. These findings were congruent with what have been reported in multiple studies who reported almost similar results compared to present study. [10, 20, 21] In another study conducted by Di Giuseppe et al. [22], although there was significant less 24-hour post-operative pain and hospitalization length which was similar to findings of present study, yet, in terms of requirement of additional analgesia (particularly opioids) no significant effect of "pudendal nerve block" was observed which was contrary to what has been found in present study. Similarly, in a meta-analysis it was reported that there was no significant effect of adjuvant "pudendal nerve block" on 24-hours post-operative pain (p = 0.26) which was opposite to what has been found in present study. [23]

Findings of present study strongly favor the recommendation of using "pudendal nerve block" as an adjuvant to spinal anesthesia in patients undergoing non-suppurative perianal surgeries and making the standard practice. There were a few limitations of present study including limited sample size, study being confined to single center and limited follow up period.

## CONCLUSION

In conclusion, "pudendal nerve block" is an effective adjuvant to spinal anesthesia in patients who undergo non-suppurative perianal surgeries as it reduces the additional analgesia need and length of hospital stay. In addition, it also increases the frequency of patients who stay pain free after 24-hours of the surgery.

## CONFLICT OF INTEREST

None.

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## AUTHORS CONTRIBUTIONS

Topic selection:
Data collection:
Article writing:
Statistical analysis:
Proofreading:

## KEY WORDS

Anesthesia, Outcomes, Perianal, Spinal anesthesia, Surgeries.

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