

## Effect of Pudendal Nerve Block Versus Perineal Local Infiltration on Post-Episiotomy Pain

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**Abstract: Background:** Pain after episiotomy is a common side effect of all normal vaginal deliveries where episiotomies have been used. Pain after delivery is associated with maternal exhaustion from mild discomfort up to severe pain causing uterine atony. Methods of pain control for episiotomy are many, however the outcome of each technique is different. **Objective:** To study the effect of pudendal nerve block versus perineal local infiltration on post-episiotomy pain. **Patients and methods:** A cross-sectional prospective study to be conducted at Obstetrics & Gynecology department in El Galaa Maternity hospital on pregnant women with certain favorable criteria. The study will include 120 pregnant women in the second stage of labor divided into two group , Group A with 60 pregnant women under bilateral Pudendal nerve block, Group B with 60 pregnant women under perineal local infiltration. All of the subjects under the study will undergo thorough explanation of the procedure and consent will be obtained before commencing and a full clinical history, physical examination and laboratory investigation for Hemoglobin concentration and coagulation profile will be collected from patients. **Results:** Out of a 60 patients under pudendal block only 5 felt mild pain after episiotomy while of the other 60 patients under local anesthetic perineal infiltration, 25 felt mild to moderate pain following the episiotomy. **Conclusion:** Skilled administration of pudendal nerve block can provide rapid and effective pain relief for women who choose not to use local perineal infiltration analgesia or who do not have the option of epidural or spinal anesthesia and would like assistance with pain relief at the end of the second stage, with operative vaginal birth or with perineal repair.

[Yehia Wafa, Mohammad Hassanin, Mohammad Almohandes, Omar Hegazy. **Effect of Pudendal Nerve Block Versus Perineal Local Infiltration on Post-Episiotomy Pain.** *Biomedicine and Nursing* 2017; 3(1): 73-78]. ISSN 2379-8211 (print); ISSN 2379-8203 (online). <http://www.nbmedicine.org>. 10. doi: [10.7537/marsbnj030117.10](https://doi.org/10.7537/marsbnj030117.10).

**Keywords:** Effect; Pudendal; Nerve Block; Perineal; Local Infiltration; Post-Episiotomy Pain

### Introduction

Pudendal analgesia, also known as a pudendal block, or saddle block, is a form of local analgesia commonly used in the practice of obstetrics to relieve pain during the delivery of fetus by forceps. The pudendal nerve block prevents fainting during forceps delivery, which was common before pudendal nerve block use was available. The analgesia is produced by blocking the pudendal nerves near the ischial spine of the pelvis. The ischial spine separates the greater and lesser sciatic foramina at the exit of the bony pelvis.

The pudendal block gets its name because a local analgesic, is injected into the pudendal canal where the pudendal nerve is located. This allows quick pain relief to the perineum, vulva, and vagina. A pudendal block is usually given in the second stage of labor just before delivery of the fetus. It relieves pain around the vagina and rectum as the fetus comes down the birth canal. It is also helpful just before an episiotomy. [1]

Local infiltration analgesia is the most commonly used method of analgesia during normal labor. This type of local analgesia is achieved by injecting the analgesic agent into the perineum just before delivery with crowning of the fetal head. It is also widely used just before an episiotomy.

In this study we compare the effectiveness and duration of pudendal nerve block versus local

infiltration on intra-partum and post partum pain. [2]

### Aim of Work

The aim of the work is to evaluate and compare the effectiveness and duration of bilateral pudendal nerve block versus perineal local infiltration in labor and post-episiotomy pain and pregnancy outcome on neonate.

### Patients & Methods

A cross-sectional prospective study to be conducted at Obstetrics & Gynecology department in El Galaa Maternity hospital on pregnant women with certain favorable criteria.

- The study will include 120 pregnant women in the second stage of labor divided into two groups

- Group A: 60 pregnant women under bilateral Pudendal nerve block
- Group B: 60 pregnant women under perineal local infiltration

- All of the subjects under the study will undergo thorough explanation of the procedure and a consent will be obtained before commencing.

- The Following data will be collected from patients

- Personal History

- Obstetric History
- Past Medical History
- Past Surgical History
- Family History
- Abdominal Examination
- Pelvic Examination
- Laboratory Investigations (Hemoglobin – Coagulation profile)

**Inclusion Criteria**

- Primigravida
- Singleton pregnancy
- Age (20-35 years)
- Medically Free of disorders
- No coagulation abnormalities
- 38weeks to 40weeks of gestational age

**Exclusion Criteria**

- Presence of infection
- Coagulation abnormalities
- History of sensitivity to local anesthetics
- Free of Obstetric complications
- Previous vaginal operations
- Malpresentation

**Technique (Material and Method):**

Vaginal sterilization with betadine 10% is performed.

**Group A:**

Palpate the ischial spine. This is usually done transvaginally. Be sure to use a needle with a guide to limit the depth of submucosal penetration and to prevent injury to the vagina and the fetus.

To perform a left-sided block, palpate the ischial spine with the index finger of the left hand, hold the syringe in the right hand, and guide the needle between the index and middle finger of the left hand toward the ischial spine. The same maneuver will be repeated for the right side.

Injection of 2.5ml on the right side and 2.5ml on the left side will be done. The injection is done after the needle is introduced nearly 1 cm and suction is done to assure no vessel penetration through the sacrospinous ligament medial and posterior to the ischial spine.

**Group B:**

In local infiltration we inject 5ml of the anesthetic agent into the perineum at the episiotomy site just before delivery.

**In both groups: Analgesic agent:** Lidocaine 1%.

Duration of analgesia will be measured and recorded since starting the procedure in both the pudendal nerve block and local infiltration techniques. [42]

**For pain scoring we are using the Numerical rating scale**

**Table 2. Pain Scale [40]**

Scale	Pain Level
0	No Pain
1–3	Mild Pain (nagging, annoying, interfering little with ADLs)
4–6	Moderate Pain (interferes significantly with ADLs)
7 – 10	Severe Pain (disabling; unable to perform ADLs)

**ADL:** Activity of daily living

**Apgar score will be used for evaluation of pregnancy outcome on the neonate**

**Table 3. Apgar score**

Component of Acronym	Score 0	Score 1	Score 2
Appearance Complexion	blue or pale all over	blue at extremities body pink (acrocyanosis)	no cyanosis body and extremities pink
Pulse rate	absent	< 100 beats per minute	> 100 beats per minute
Reflex irritability grimace	No response to stimulation	grimace on suction or aggressive stimulation	cry on stimulation
Activity	none	some flexion	flexed arms and legs that resist extension
Respiratory Effort	absent	weak, irregular, gasping	strong, lusty cry

Neonatal assessment takes place at 1 minute, 5 minutes and 10 minutes post labor and Apgar scoring is recorded accordingly.

**Results****Main results:**

- We found 149 patient for consideration of inclusion into this review.
- We included only 60 pregnant women under

bilateral Pudendal nerve block and another 60 pregnant women under perineal local infiltration

#### **Pudendal nerve block versus local perineal infiltration for associated post-episiotomy pain**

We found that more women were satisfied with pain relief after bilateral pudendal nerve block than after local perineal infiltration on a pain scale of 0 to 10 (one study, 120 participants, relative risk (RR) 0.19 and relative risk reduction with bilateral pudendal block (RRR) 0.81, 95% confidence interval (CI) (0.82-5.78).

#### **Pudendal nerve block versus local perineal infiltration for associated maternal side effects**

Bilateral pudendal nerve block was associated side effects all of which was minimal in the form of vague pain sensation in hips or legs versus no single side effect reported after local perineal infiltration (one study, 120 participants, RR 29.0, 95% CI (25-30).

#### **Pudendal nerve block versus local perineal infiltration for associated neonatal side effects**

In both techniques there were no reported neonatal side effects.

### **Discussion**

#### **Local Anesthetic Used For Pudendal Nerve Block**

The anesthetic commonly used in pudendal nerve block is 1% lidocaine. [18] Lidocaine is rapidly absorbed, crosses the placenta, and is detectable in maternal venous and fetal scalp blood within 5 minutes after injection, with peak levels attained between 10 and 20 minutes after injection. [18] A maximum block may take up to 20 minutes to achieve because the pudendal nerve is a large peripheral nerve with a smaller surface area to volume ratio and a myelin sheath. Hence, the speed of onset of anesthetic effect is delayed and time to maximum block takes longer to achieve than the usual 5 minutes for subcutaneous infiltration of the perineum. [23] The average duration of action of lidocaine is 30 to 60 minutes. [29] Safe dosing of 1% lidocaine is 3mg/kg (204 mg in a woman who is 150 lbs.) [23] to 4.5mg/kg (300mg in a woman who is 150 lbs). The maximum recommended dose is 300mg. [29]

Other anesthetics that have been used for pudendal nerve blocks include 1% mepivacaine (Carbocaine), 0.25% bupivacaine (Marcaine), and 2% 2-chloroprocaine (Nesacaine).[20] Because of its rapid onset of action, 2% solution of 2-chloroprocaine can be used immediately before birth. It does, however, have the disadvantage of a shorter duration of action (15-30 minutes). [11]

In older studies, investigators evaluated whether the addition of low-dose epinephrine to lidocaine or mepivacaine increased the intensity and duration of

the analgesic effect. In a prospective double-blind randomized controlled trial (RCT) of 151 women receiving pudendal nerve block in the second stage of labor, Schierup[20] found no difference in the effectiveness of the analgesic block when 20 mg of 1% mepivacaine with or without epinephrine were compared.

Other trials have reported that the addition of epinephrine to lidocaine or mepivacaine is associated with a more effective block. In an RCT of 865 women receiving pudendal nerve block before or during the second stage, Langhoff-Roos[17] found pudendal nerve block with epinephrine added to 1% mepivacaine had a significantly better analgesic effect than 1% mepivacaine without epinephrine ( $P < .01$ ) or 0.25% bupivacaine without epinephrine ( $P < .05$ ). Zador [18] compared the analgesic effect of pudendal nerve block administered to women who were fully dilated with lidocaine, with and without epinephrine. Pudendal block with lidocaine and epinephrine at a 1:200,000 concentration was associated with better pain relief scores and a longer duration of analgesia. Statistical significance was not reported.

The lack of current research combined with the limited and conflicting available research data make it difficult to assess any additional pain relief benefit for the addition of epinephrine to pudendal nerve block. Although there are not sufficient data to draw conclusions about whether epinephrine prolongs the duration of action of local anesthetics used to achieve pudendal nerve block, studies of the addition of epinephrine to local anesthetics used in anesthesia for other areas of the body have demonstrated a prolongation of the duration of action of local anesthetics.[32]

However, any potential benefit of adding epinephrine to pudendal nerve block is likely outweighed by the risks of its adverse effects on labor. Contemporary obstetric texts do not include recommendations for the addition of epinephrine to local anesthetics used in pudendal nerve blocks. [11, 31] .

#### **Effects of Pudendal Nerve Block on Labor**

The research from Schierup, [20] Langhoff-Roos, [17] and Zador [18] also addressed the effect on labor of different anesthetic agents, with and without additional epinephrine. Zador[18] studied the length of second stage in 24 randomly selected women who, at the onset of second stage, received pudendal nerve block with 200 mg of 1% lidocaine, with and without epinephrine (1:200,000), and compared them to a control group without pudendal nerve block. Pudendal nerve block initiated with 1% lidocaine without epinephrine, was associated with a longer mean duration of the second stage, in both nulliparas and

multiparas (15 minutes and 5 minutes respectively) when compared to the women in the control group who did not have a pudendal nerve block. The addition of epinephrine to the pudendal nerve block was also associated with a longer mean duration of the second stage in nulliparas (20 minutes longer in nulliparas; no multiparas in this group) when compared to the women in the control group. Of the 5 women who had a vacuum-assisted birth, 4 were in the group with 1% lidocaine with epinephrine. Statistical significance was not reported. The authors attributed the increase in mean duration of second stage to the abolishment of the bearing down reflex.

The RCT by Schierup [20] compared the effect of pudendal nerve block administered at the end of second stage, with 20 cc of 1% mepivacaine (Carbocaine) with and without epinephrine. Women who received a pudendal nerve block with 1% mepivacaine with epinephrine had a slightly longer ( $P < .02$ ) time interval from pudendal nerve block to birth (ranging from 1-24 minutes longer, mean of 4 minutes) compared to the women who received 1% mepivacaine without epinephrine.

This time difference may or may not have clinical significance. The authors concluded that 20 cc of 1% mepivacaine without epinephrine is an effective choice for pudendal nerve block without the potential disadvantages of adding epinephrine. The RCT by Langhoff-Roos [17] evaluated the effect on labor of pudendal nerve block with 3 different local anesthetics: 1% mepivacaine without epinephrine, 1% mepivacaine with epinephrine, and 0.25% bupivacaine without epinephrine. Pudendal nerve block was administered to 865 women before and during the second stage. Loss of the urge to bear down was reported by 31% of all of the women who received the pudendal nerve block. Loss of the bearing down reflex was more common among the women in the group who received pudendal nerve block with 1% mepivacaine and epinephrine, compared to the women who received 1% mepivacaine without epinephrine or 0.25% bupivacaine without epinephrine ( $P < .01$ ). Among the 3 groups, mean time from pudendal nerve block to birth, mean duration of the second stage, frequency of vacuum extractions, and frequency of intravenous oxytocin administration was the same in all groups. Intranasal oxytocin was used significantly more often by the women in the 1% mepivacaine with epinephrine group ( $P < .05$ ) compared with the other 2 groups. The study findings were not, however, compared to a control group without pudendal nerve block.

Based on this limited and older data, pudendal nerve block is associated with a decreased urge to bear down and a possible increase in the length of the second stage and analgesic block to birth time, with

unclear clinical significance. Providing anticipatory guidance to parturients about the possible loss of the urge to push, followed by supportive guidance during pushing efforts during the second stage, may be helpful to women who choose pudendal nerve block. The addition of epinephrine to lidocaine or mepivacaine with pudendal nerve block may result in more adverse effects on labor than pudendal nerve block without epinephrine.

### Neonatal Effects of Pudendal Nerve Block

When the neurobehavioral responses of newborns whose mothers received bupivacaine, mepivacaine, or 2-chloroprocaine for pudendal nerve block were studied, there was no significant effect of any of the agents on newborn neurobehavioral indices at 4 and 24 hours, with the exception of a better response to pinprick at 4 hours in the mepivacaine-exposed neonate. [33]

### Complications of Pudendal Nerve Block

Complications of pudendal nerve block are rare but can be serious. Systemic toxicity due to inadvertent intravascular administration or excessive doses of anesthetic may result in tinnitus, disorientation, drowsiness, confusion, loss of consciousness, palpitations, hypotension, bradycardia, convulsions, and coma. [11] This can be prevented with careful aspiration before injection of the anesthetic and attention to total dose of anesthetic. Emergency resuscitation equipment should be available when administering a pudendal nerve block.

Inadvertent vascular injury of a pudendal vessel in the course of initiating pudendal nerve block may result in a retroperitoneal hematoma and subsequent infection of the hematoma. They are usually small and surgical intervention is rarely needed. The classic signs and symptoms of an infected retroperitoneal hematoma are a postpartum temperature elevation with a decreasing hematocrit. Other signs and symptoms include pain in the abdomen or hip on the side of pudendal nerve block, fever, chills, increasing abdominal pain with radiation to the lower quadrant, decreased bowel sounds, and deviation of the uterus away from the hematoma.

Infected retroperitoneal hematomas may often be treated conservatively with antibiotics. [14]

Most women have no sequelae if blood is aspirated during the pudendal nerve block procedure. Keep in mind, however, the possibility of hematoma formation during the postpartum course. Hematoma formation may also occur without observing aspirated blood during pudendal nerve block, for example, when a pudendal needle passes through a vessel and aspiration yields no blood. Women with defective coagulation have a higher risk of hematoma. [14]

Contamination by vaginal or rectal flora during pudendal nerve block may result in localized infection. Retropsoas and subgluteal abscesses following pudendal nerve block have been reported. A diagnosis of retropsoas or subgluteal abscess should be considered in the woman who has received pudendal nerve block and is experiencing vague to severe pain in the hip, leg, buttock, back, abdomen, or perineum during the early postpartum period. This is often accompanied by increasing fever and limp. Management includes treatment with antibiotics, incision and drainage, and close follow-up. Commonly cultured organisms are *Escherichia coli*, *Bacteroides*, and *anaerobic Streptococcus*. [34]

Other unlikely complications include allergic reaction to the anesthetic, pudendal nerve damage, temporary paresthesia in the ischial region, [17] sacral neuropathy, and inadvertent needle puncture of the mother or provider.

Fetal and neonatal complications are extremely rare and include inadvertent injection of anesthetic into the scalp and needle puncture. One case report described 3 cases of neonatal lidocaine intoxication. [35]

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3/21/2017