

# PREVALENCE AND MANAGEMENT ASPECTS OF SPINAL POST-ANESTHESIA HEADACHE

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**Abstract:** Regional anesthesia is to block nociceptive transmission in clearly defined territories, using local anesthetic, depending on the specific fibers to be blocked and on the characteristics of the patient. Spinal post-anesthesia headache is a common complication of this procedure being determined by the loss of CSF in the injection site. If it persists, it can become annoying, even debilitating. Patient age and gender influence the prevalence of lumbar postpuncture headache in that it is more common in young than in the elderly and in women than in men. In terms of timing, in most cases, headaches are installed 24 hours postoperatively. The main pharmacological classes used to control spinal post-anesthesia headache are painkillers, anti-inflammatory and corticosteroids. When the headache increases in intensity and duration, and it is refractory to drug therapy, we appeal to the blood patch method. It is usually reduced by the administration of pain relievers, which means it can be treated fairly easily.

## INTRODUCTION

Spinal anesthesia has been used for a long time, it can be applied to more types of surgery, from the upper abdominal surgery to kidney surgery, using multiple areas of the spine, but the most frequent was the lumbar region namely subarachnoid space.(1) Regional anesthesia is to block transmission of nociceptive in clearly defined territories, using local anesthetic, depending on the specific fibers to be blocked and on the characteristics of the patient.

Like any other anesthetic procedure, regional anesthesia has advantages and disadvantages. Among the advantages it is worth mentioning: the patient is awake, aware, the recovery is fast, postoperative analgesia, hemodynamic equilibration in patients with coronary disease, faster discharge, so low hospital costs. Among the disadvantages it is worth mentioning: patient refusal, the duration of the installation of the block may be extended to a longer period, neurological sequelae may occur, especially in the elderly.

Subarachnoid anesthesia complications are: hypotension, insufficient extended block or complete failure, high spinal block with ascension of motor paralysis, nerve injury, spinal artery syndrome, space replacement process, dural postpuncture headache.(2)

Headache is one of the most common algic syndromes that appear after spinal anesthesia or amid a genetic predisposition or as a result of triggers in neurological terms. In 2003 the International Headache Society suggested its classification as primary and secondary headache.(3) Headache is caused by decreased pressure in cerebrospinal fluid (CSF) due to dural puncture with a spinal needle with a thickness less than 26G and that drains CSF through the venipuncture site.(4,5)

The incidence of spinal post-anesthesia headache decreases with age, the young complaining more frequently of headaches than the elderly. Postpuncture headache seems to

depend also on the gender of the patient, being more common in women.(6)

## PURPOSE

### Study objectives:

- Identifying the prevalence of spinal post-anesthesia headache in studied groups, according to the interval of occurrence
- Establishing a relationship of dependency between the age and gender of the patient and the frequency of spinal postpuncture headache
- Identifying the pharmacological classes frequently used to combat spinal post-anesthesia headache

**The research hypothesis** is that spinal post-anesthesia headache occurs more frequently in younger age and predominantly in women compared to men. Most often, headache installs 24 hours after the puncture.

## MATERIALS AND METHODS

It is a prospective study conducted over a period of 3 months (January-April 2016), in the Emergency County Hospital from Craiova. The lot consisted of 136 patients, 82 urologists and 54 patients in clinical Obstetrics and Gynecology. All patients underwent endoscopic or classic surgery, or with spinal anesthesia with 0.5% Marcain, being performed at L3-L4 spinal level, in strict aseptic conditions using 25 G needles.

To achieve the study, we created a database collected from clinical observation sheets, general anesthesia sheet, operator protocols, IT system management of medical activity. On these data we applied several criteria so that its analysis could support the goals of the study. The results were translated into suggestive graphics of their statistical relevance.

## RESULTS

The figure no 1. shows that two age groups prevail in

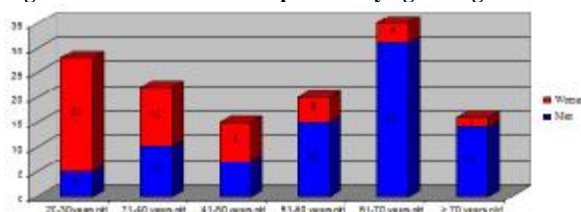
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this category, i.e. 20-30 years old and 61-70 years old. Also, the distribution of patients by gender shows a higher number of young women and men within 70 years, the overall situation generated by the pathology that required surgery and characterizes the respective ages namely caesarean section for women and prostate adenomas, bladder tumours, strictures of the urethra for men.

**Figure no. 1. Distribution of patients by age and gender**



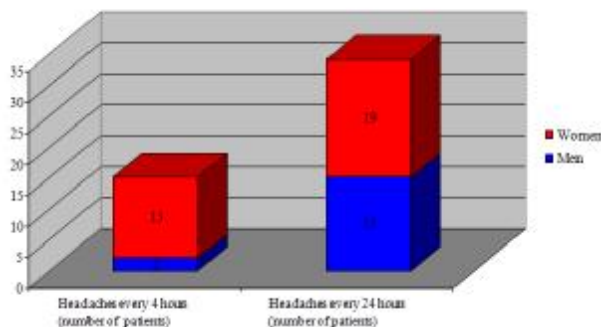
**Figure no. 2. Prevalence of spinal post-anesthesia headache in the study group**



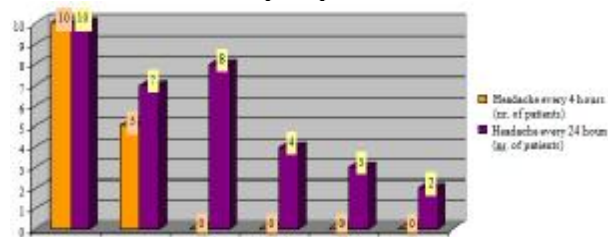
The number of patients who had spinal post-anesthesia headache represents more than ¼ of the study group, which gives statistical significance and emphasizes the idea that headache is a common complication of spinal puncture.

The dependency relationship between the patient's age and gender and the frequency of spinal post-puncture headache, including the time of occurrence is highlighted by the following two figures:

**Figure no. 3. Distribution of patients with headache depending on gender and time of occurrence**



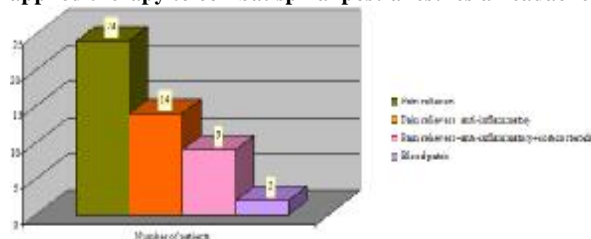
**Figure no. 4. Distribution of patients depending on age and the time of occurrence of spinal post-anesthesia headache**



Headache was treated with pain relievers, anti-inflammatory, infusion liquids, up to 3 liters/day, corticosteroids. Adjacent events, nausea and vomiting, were fought with antiemetics. There was a limited number of patients with emphasized symptom, despite the administered treatment and the pain persisted for several days until it became very annoying, even debilitating. These patients, in number of two, were 21 and 24 years old, both females and they were carried out the *blood patch* method.

Out of the 49 patients who had postoperative headache the pain succumbed either to only pain relievers administration (24 patients with mild headache, resolved immediately) or to the administration of pain relievers and anti-inflammatory (14 patients with moderate headache, resolved within an hour) or to the administration of analgesics, anti-inflammatory and corticosteroids (9 patients with persistent headache for more than 3 hours).

**Figure no. 5. Distribution of patients according to the applied therapy to combat spinal post-anesthesia headache**



## DISCUSSIONS

Regional anesthesia is applied fairly often in the age group between 65-85 years old who has specific features that require an optimal regional anesthesia.(7) Regarding pregnant patients, especially patients with pre-eclampsia, it was shown that spinal anesthesia, epidurals, or both, have more advantages than general anesthesia, the latter having risks for both mother and fetus. Among these disadvantages are worth mentioning: difficult intubation due to mucosal edema, raised breasts, obesity, increased risk of bronchial aspiration, thus large and serious obstacles to intubation.(8) In addition, all drugs used for general anesthesia may have repercussions on the fetus from hypoxia, respiratory and cardiac depression to underactive hypotonia. Therefore it was resorted to spinal anesthesia as, for the pregnant woman, in addition to all the benefits of spinal anesthesia, consciousness comes first, because she can see the child right out and the joy is immense, so a good indescribable feeling, without amending intracranial pressure, the placental irrigation after spinal anesthesia is effective, leading to good fetal irrigation, complete sensory and motor block without any pain, so large operator comfort.(9)

Nerve block, which occurs after regional anesthesia, can be influenced by the decrease of neurons, axons from the peripheral nerves, speed management, changes in the spine and intervertebral holes.(10,11) Factors influencing the extension, and spinal anesthesia duration, are dose, gravity, rapacity, needle type and speed of injection, pregnancy in the last quarter, the use of vasoconstrictives.(12) Comparing extension of analgesia in elderly patients to young patients, it was demonstrated that it is higher in the first category of patients compared to the second category.(13,14) There has been also demonstrated a more rapid onset and a regression of higher block in elderly patients.(15)

Local anesthetics used in clinical practice in amino acids class are: Lidocaine, Bupivacaine, Ropivacaine,

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Levobupivacaine whereas the spinal needles are of different sizes, from 20 G to 26 G. We can compare the pharmacokinetics and pharmacodynamics of local anesthetics, and say that the rate of absorption decreases with age. Such thing cannot be said about the plasma protein binding, these not being influenced by age, so  $\alpha_1$ -acid glycoprotein (AAG) that links local anesthetics is not influenced by age.(16,17,18,19)

Spinal post-anesthesia incidence of headache decreases with age, the explanation being that connective tissue elasticity is reduced.(20)

Headache is routinely generated by the dural puncture with a spinal needle under 26G. The smaller the needle diameter is, the smaller the risk of headache gets. The prevalence of spinal post-anesthesia headache seems to also depend on age, the young accusing more frequent headaches than the old, but it also depends on gender and it is more common in women, especially pregnant women.(21)

Spinal post-anesthesia headache may occur on the first day, 4 hours after surgery or the next day. It finds different locations, from the occipital area to the frontal area, but it can generalize, with or without meningism, vomiting, eye disorders (photophobia). These events are part of *migraine without aura*, the most common clinical form but it is quite dangerous because it can turn into chronic migraine or migraine status. Headache loses original characteristics in the case of chronic migraine and the migraine is very high in intensity and duration, nausea and vomiting being slightly improved or influenced with difficulty.(22)

The treatment of mild to moderate headache includes analgesics administered orally, intravenously or intramuscularly. If the headache persists, the *blood patch* method is applied, that is injection in the epidural space of 10 to 15 ml blood from the patient.

The treatment of migraine status consists in hydration of 2-3 liters per day, anti-emetics to control vomiting (10mg of metoclopramide intravenously in 100 ml of physiological saline), corticosteroids (8mg of dexamethasone intravenously, except for the patients with diabetes), benzodiazepines (10mg of diazepam intravenously) to remove anxiety, antipsychotics (Chlorpromazine 0.1 mg/kg), analgesics (paracetamol, 1g of Algocalmin every 6 hours), anti-inflammatory drugs (80mg of Tador intravenously every 8 hours), also avoid cough and movements that may enhance the pain and have a lot of rest. Paracetamol has central predominant mechanism of action, is very well tolerated with low gastrointestinal and renal toxicity, it does not affect platelet function or prostaglandin synthesis in the periphery, so there is no risk of postoperative bleeding, but does not have an anti-inflammatory role.(23,24) Dexamethasone reduces inflammation with high intensity, being a synthetic glucocorticoid which does not lead to hydro-saline retention and it has to be administered in short courses in order not to suppress the hypothalamic-pituitary-cortico-renal axis. Diazepam, in addition to the role of sedative, also has anxiolytic and miorelaxing role, by potentiating GABAergic inhibitory mediation at the spinal cord level, being a depressant of the central nervous system. Chlorpromazine is a typical neuroleptic, a phenothiazine derivative, which in addition to its CNS depressant role, has anti-emetic, anxiolytic, sedative effect by blocking dopamine receptors in the hypothalamus and bulb, and alpha adrenergic receptors in the peripheral and central level. Antiemetics act on the level of central formations that cause vomiting through the release and influence of neurotransmitters with central action. Metoclopramide has great prokinetic and antiemetic effect by

blocking the D2 receptors in the trigger area of the vomiting center, 5-HT3 receptors, it stimulates the release of acetylcholine from myenteric plexus and it is part of benzamide class.(25)

Non-opioid painkillers are used for both their peripheral analgesia and their central spinal and supraspinal action.(26) Among recommended painkillers are those that selectively block COX-2, because the risk of bleeding, postoperative bleeding complications or renal dysfunction are low.(27,28)

Postoperative monitoring of the patient is very important, both to capture the occurrence of headache and to intervene early in combating it, and to assess the effectiveness and efficiency of the therapy instituted. This ensures patient a state of wellbeing and comfort that favourably influences their evolution.

## CONCLUSIONS

Spinal post-anesthesia headache is a common complication of this procedure being caused by the loss of CSF at the injection site. If it persists, it can become annoying, even debilitating. Besides headaches, as incidents, vomiting and hypotension are symptoms that subside immediately and irreversibly. Patient age and gender influence the prevalence of lumbar postpuncture headache in that it is more common in the young than in the elderly and in women more than in men. In terms of timing, in most cases, headaches are installed 24 hours postoperatively. The main pharmacological classes used to control spinal post-anesthesia headache are painkillers, anti-inflammatory and corticosteroids. When the headache is increased in intensity and duration, refractory to drug therapy, we appeal to the *blood patch* method. It usually resolves with the administration of pain relievers, which means it can be treated fairly easily.

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