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ORIGINAL ARTICLE

Study the Effect of Spinal Anesthesia upon Demographic Parameters At Al-Ramadi Teaching Hospital in Anbar Governorate

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KEYWORDS

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ABSTRACT: Post-Dural puncture headache (PDPH) is an unpleasant consequence following regional anesthesia, especially in younger people, that requires precaution to avoid. The purpose of this study was to examine the association between patients and demographic parameters such as age, sex, marital status, residency, and kind of operation, as well as the influence of the gage of a spinal needle on headache severity. In our recent study, the incidence is estimated to be around 20%. The size of the dural perforation is the most important element in the development of PDPH. Other variables, such as the geometry of the dural perforation and the direction of the spinal needle, play a smaller influence. Increasing the gauge (G) of the needle used for spinal anesthetic could be a sensible way to reduce the risk of PDPH. As a result, a compromise between the danger of PDPH and the danger of technical failure has been reached. We conclude to use spinal needl with the high gauge to reduce the P.D.P.H. but had non-significant on the demographic parameters.

INTRODUCTON

Spinal anesthesia, also known as spinal analgesia or subarachnoid block, is a type of neuraxial block in which opioids, local anesthetics, or other suitable drugs are injected into the subarachnoid space [1, 2]. Although the amount of its benefit is not universally agreed upon, spinal anesthesia has various advantages for operations. Despite the fact that spinal anesthesia (SA) has been utilized for many years, there are still debates concerning when these blocks should be utilized in specific situations [3, 4]. Bier experienced back and leg pain, vomiting, and a headache as a result of the procedure. He had linked cerebrospinal fluid loss with a post-spinal headache even at this early stage [5]. The limited duration of anesthesia and a higher incidence of hypotension are also disadvantages of this approach. Because of the risk of PSPH, several researchers believe SA is not acceptable for outpatients [6, 7].

Similarly, because of the short time between injection and surgical anesthetic, spinal anesthetic appears to be suitable for cesarean section patients [8]. The use of local anesthesia for spinal anesthesia has become common. Anesthetic is used in procedures on the lower abdomen (such as appendectomy) and lower extremities, where it lowers the negative effects of the drugs used in general anesthesia, especially in patients with disorders. It minimizes the incidence of inhalation and assures greater and longer-term analgesia following surgery than general anesthesia, and it minimizes the incidence of cardiac, respiratory, or hepatic disorders [9-11].

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Opiates, ketamine, neostigmine, clonidine, and other substances have been added to local anesthetics to extend the duration and effectiveness of spinal anesthesia, but their use has remained limited due to the various side effects they cause, such as itching, urinary retention, and difficulty breathing. Hemodynamic instability, nystagmus, and severe nausea and vomiting [12, 13] are all symptoms to look out for. Regional anesthesia, in all of its forms, is distinguished by its high effectiveness, rapid onset of anesthesia, ease of administration, and lack of interference with the patient's respiratory system; however, one of the major disadvantages of regional anesthesia is its hemodynamic effects, which vary depending on the type of regional anesthesia [14]. In order for the nerve roots to be buried in the subarachnoid or epidural region, topical medications are injected into the cerebrospinal fluid (spinal anesthesia) or into the epidural space (epidural and caudal blockage) [11]. In most circumstances, contrasted blockade leads to friendly blockade (revealed by assessing heat sensitivity). It may be more than sensory blockade (pain and touch senses), and the latter is more than kinetic blockage with two levels of intensity [15]. The most prevalent negative effect of regional anesthetic is hypotension. It is caused by the blockage of sympathetic nodes and is commonly accompanied by dizziness, nausea, and extreme discomfort in the patient. Hypotension can also be problematic for the elderly, diabetics, hypertensive patients, and anyone with heart disease in general. It's also worth noting that after spinal anesthesia, circulatory alterations can occur suddenly. Regional anesthesia, head pain, back discomfort, and the formation of an epidural hematoma are some of the other negative effects [11]. The sensory blockade suppresses both physical and visceral pain stimuli, while the locomotor blockade provides good musculoskeletal relaxation. Spinal blockade provides an excellent surgical condition because it restrains the transmission of painful stimuli and relaxes structural muscle strengthening. It may be higher than a two-sided motor blockade, and it may be higher than a sensory blockage (the perception of pain and touch) with two limbs [16]. Various local medications, as well as many chemicals such as vasodilators, opioids, and other medicines, are used in spinal anesthesia to extend the duration of the spinal blockade and boost its effectiveness [17].

MATERIALS AND METHODS

The current observational case reference study took place in the Al-Ramadi Teaching Hospital in Iraq's Al-Anbar Province. The research began on March 9, 2020, and ended on April 13, 2021. A total of 100 patients were involved. All of them were undergoing spinal anesthesia for various surgical procedures. A spinal needle of gauge 22 was utilized in 50 patients, while a spinal needle of gauge 24 was utilized in the second group (n = 50). All of the patients were told they couldn't eat or drink anything for the rest of the night.

They were administered ranitidine 50 mg and metoclopramide 10 mg as premedications. On arriving in the operating room, an 18 gauge cannula was used to establish an intravenous line in the antecubital vein. A pulse oximeter, blood pressure, pulse rate, and ECG were among the instruments used. Before initiating subarachnoid block, an intravenous fluid in the form of ringer lactate was administered in a dose of 10ml kg^{-1} for 10 minutes. A Quincke spinal needle was utilized in a midline approach with the patient in a sitting position at L3-L4 or L4-L5 level (22G or 24G). It was easy to keep the needle bevel parallel to the Dural fiber. Once clean CSF fluid was collected, heavy bupivacaine 9-12.5 mg (1.8-2.5ml) was injected.

The institutional ethical approval committee gave their approval to this investigation, and each participant gave their verbal agreement. Age, gender, marital status, residency, kind of operation and headache were all variables in the current study. For statistical description and analysis, the collected data were entered into an SPSS (IBM, Chicago, USA, version 23) spreadsheet. The Chi-square test was used to investigate the relationship between categorical and quantitative variables, while the independent samples t-test was utilized to investigate the mean difference between the two research groups.

RESULTS AND DISCUSSION

This study comprised 100 individuals who were getting spinal anesthetic for a variety of procedures and were divided into two groups based on the size of the spinal require caliber (gauge 22 versus gauge 24). Table 1 shows the distribution of patients by age, gender, marital status, residence, and kind of operation. Between the two study groups, there was no significant difference in mean age or distribution by gender, marital status, residence, or kind of operation.

The distribution of patient knowledge about the effect of S.A. on headache is shown in Table 2. Table 3 shows the rate of post-spinal puncture headache (PSPH). Patients in the first group (gauge 22) had more headaches than those in the second group (gauge 24), 15 (30%) versus 38 (76%), respectively, and the difference was very significant. Furthermore, only group 1 had a significant headache (gauge 22).

Table 1. Distribution of the study sample by their Demographic Data.

Variables	Group 1 (Gauge22) No.50	Group 2 (Gauge24) No.50	Significant
Age			
Range	33-73	35- 71	
Mean±SD	52.42±11.02	57.62±10.36	NS §
Gender			
Male No. (%)	36 (72 %)	37 (74 %)	NS ¥
Female No. (%)	14 (28 %)	13 (26 %)	
Marital status			
Single No. (%)	9 (18%)	7 (14%)	NS ¥
Married No. (%)	41 (82%)	43 (86%)	
Resident			
Rural No. (%)	23 (46 %)	21 (42 %)	NS ¥
Urban No. (%)	27 (54 %)	29 (58 %)	
Type of operation			
Selective No. (%)	40 (80 %)	42 (84 %)	NS ¥
Emergency No. (%)	10 (20 %)	8 (16 %)	

No.=Number of case, SD=Standard deviation, NS= no significant, §=independent samples t-test, ¥ = Chi-square test

Table 2. Distribution of patient knowledge toward Effect of Spinal Anesthesia Upon Headache.

No.	Items	Yes	%	No	%
1	Have you had a spinal Anesthesia before	50	50%	50	50%
2	Did you have a sever headache last time	50	50%	50	50%
3	Did you know that headache increase in intensity by sitting or standing and decreasing a little while lying down	70	70%	30	30%
4	Did you suffer from neck pain and intolerance to light	45	45%	55	55%
5	Do you suffer from a problem with the blood clotting process or take a medicine sc. such as clexane	5	5%	95	95%
6	Is the headache after S.A. accompanied by a hearing disturbance or ringing in the ears	45	45%	55	55%
7	Is the headache after S.A. accompanied by feeling dizzy, nausea, and vomiting	85	85%	15	15%
8	Did the headache symptoms appear immediately after S.A.	85	85%	15	15%
9	Did you have previous operation in the spin	0	0.0%	100	100%

Table3. Rate of post-spinal puncture headache according to group

Headache	Group 1 (Gauge 22) No.50	%	Group (Gauge 24) No.50	%	Significant
No	15	30%	38	76%	HS ¥
Mild	20	40%	10	20%	HS ¥
Moderate	8	16%	2	4%	HS ¥
Severe	7	14%	0	0.0%	HS ¥

¥ = Chi-square test, HS = Highly significant at $P \leq 0.001$

We were able to show in this study that post-spinal puncture headache is a fairly common complication associated with spinal anesthesia; however, the rate of this complication and its severity is clearly related to the caliber size of the spinal needle, with smaller needles (24G) being associated with a less frequent and severe headache than large bore needles (22G). As a result, we can assume that a narrow needle is associated with minimal CSF leakage and, as a result, minimal if any dural tension due to lower subarachnoid pressure. In addition to a list of other risk factors, the use of a large diameter spinal needle has been identified as a risk factor for the development of post-spinal puncture headache (PSPH) [18, 19]. The use of a cutting needle, especially one that is twisted or inserted perpendicular to the axis of longitude of the dura fibers, minimizes the danger, while the use of a thin caliber pencil-tipped spinal needle minimizes the danger. The occurrence rate has been estimated to be highly diverse in the existing published medical literature; nonetheless, it might be as low as 10% to as high as 40%, depending on the size of the spinal needle used (less than or equal to 24 gauge). The type and breadth of needle used in PSPH are significant considerations, given that research shows that more dural injury correlates to a higher rate of this complication. [20, 21] In comparison to pencil-point or dull needles, quicker cutting needles are frequently associated with a higher rate of PSPH. In strong support of our current findings, Gisore et al. (2010) [22] and Schmittner et al. (2010) [23] reported that pencil-point needles had a considerably lower rate of PSPH than Quincke cutting needles. A Quincke needle with a cutting point and a double bevel have been developed to create a small dural hole followed by hole dilation. Several prior studies have found that the broader the needle, the higher the risk of PSPH [24, 25].

Furthermore, it has been demonstrated that the size of the spinal needle is connected to the intensity of the headache. This is also supported by our findings. According to recent research and some previous reports, the incidence and severity of post-spinal puncture headache (PSPH) are significantly related to the size of the spinal needle, with narrower needles being associated with a less frequent and milder form of a headache than wider bore needles [26,27].

Because spinal anesthesia does not block the vagus nerve, we conclude that it causes a specific degree of sympathetic blockade, as well as the emergence of physiological responses resulting from the lack of sympathetic tonic and or the remaining effective non-opposite of the sympathetic tonic, and these results in a variety of effects in the body [20].

Age, gender, number of attempts, needle type (design), and size, as well as a history of past PSPH or chronic headache, seemed to make a patient more likely to develop PSPH after spinal anesthesia. It's possible that operator experience has an inverse relationship with the occurrence of PSPH. It is critical to identify indicators that predict the incidence of PSPH so that steps can be made to reduce this severe complication of spinal anesthesia [24, 25].

CONCLUSIONS

In our recent study, the incidence is estimated to be around 20%. The size of the dural perforation is the most important element in the development of PDPH. Other variables, such as the geometry of the dural perforation and the direction of the spinal needle, play a smaller influence. To reduce the risk of PSPH, increasing the needle gauge (G) used for spinal anesthetic may be a logical approach. As a result, a compromise has been reached between the danger of PDPH and the danger of technical failure. We conclude to use spinal needl with the high gauge to reduce the P.D.P.H. but had non-significant on the demographic parameters.

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Conflict of interest

The authors declare no conflict of interest.

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Self

ETHICAL CONSIDERATHION

Permission to conduct this study was issued by the health institutional; Al-Ramadi Teaching Hospital in Al-Anbar Province and the sampling from patients was carried out by a public health technician

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