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Post-Dural Puncture Headache in Lowerlimb and Lower Abdominal Surgeries –A Comparative Study between 25 G Quincke and 25 G Whitacre Needle

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Abstract **Original Research Article**

To compare the incidence and severity of PDPH in lower abdominal and lower limb surgeries using 25 G Quincke and 25 Whitacre spinal needles. After Ethical Committee clearance and obtaining informed written consent from the patient. 100 patients of ASA 1 and 2 of age group 18-45 years posted for lower abdominal and lower limb surgeries in Government Mohan Kumaramangalam Medical college in the Study period were included. Study population was divided into 2 groups- GROUP 1(Patients who received spinal anaesthesia with 25 G quincke needle)- GROUP 2(Patients who received spinal anaesthesia with 25 G whitacre needle). In our study we concluded that non cutting needle like 25 gauge whitacre produces a Statistically significant difference ($p<0.05$) of incidence of post dural puncture headache than cutting spinal needle like 25 gauge quincke needle.

Keywords: PDPH, Spinal Anaesthesia, Pencilpoint spinal needles, Whitacre, Quincke spinal needle, Lower abdominal and Lower limb surgeries.

INTRODUCTION

Post Dural puncture headache (PDPH) is well recognized complication of subarachnoid block. PDPH following subarachnoid block because of arachnoid and dural puncture and significally affects patients postoperative well being.

The incidence of PDPH by intentional dural puncture is0.1 to 36% but it is 3.1% by pencil point needles such as 25 G Whitacre spinal needle. The presence of predisposing factors such as female, young patients, low BMI, inexperience performers, pregnancy and multiple attempts increases the incidence of headache. Identification of factors which predisposes to headache is important to minimize this complication.

AIMS AND OBJECTIVES

To compare the incidence and severity of PDPH in lower abdominal and lower limb surgeries using 25 G Quincke and 25 G Whitacre spinal needles.

MATERIALS & METHODS

This study was designed to find out the incidence of Post dural Puncture Headache in patients of age group 18-45 years posted for lower abdominal and lower limb surgeries using 25 G Quincke and 25 G Whitacre spinal needle. This study also compares the cost factors between these two different groups of needles

SOURCE OF DATA

After Ethical Committee clearance and obtaining informed written consent from the patient. 100 patients of ASA 1 and 2 of age group 18-45 years posted for lower abdominal and lower limb surgeries in Government Mohan Kumaramangalam Medical College were included.

Study population was divided into 2 groups:

GROUP 1 – Patients who received spinal anaesthesia with 25 G quincke needle

GROUP 2- Patients who received spinal anaesthesia with 25 G whitacre needle

STUDY DESIGN

A Prospective randomized double blinded controlled study was done.

METHOD OF STUDY

- Thorough and detailed history of present and past medical illness were taken.
- Past history of anaesthetic exposure with concomitant history of drugs taken in the pre - operative period.
- Routine investigations including coagulation profile done.
- General and systemic examination done.
- All procedures performed in sitting position by the same anaesthesiologist.
- Back of patient cleaned with povidone iodine and spirit and draped with sterile towels.
- Spinal anaesthesia was performed using midline approach at L2-L3 or L3-L4 using one of the above needles and 0.5 % of 2-3ml Bupivacaine was injected and patient turned to supine position.
- Level of sensory blockade and changes in parameters like heart rate and BP will be recorded.
- Solution of Ringer Lactate, colloid and blood transfused according to loss.
- Hypotension treated with Injection ephedrine 6 mg IV.
- Complication like nausea, vomiting, bradycardia and respiratory depression were managed symptomatically.
- Different anaesthesiologists not knowing the type of needle used, did post operative observations.
- Patients were interviewed day 1,2,3,4 and 5 and were questioned regarding headache, its severity, location, character, duration and associated symptoms like nausea, vomiting, auditory and ocular symptoms.

CRITERIA FOR PDPH

- Occurred after mobilization.
- Aggravated by erect or sitting position and coughing, sneezing or straining.
- Relieved by lying flat.
- Mostly localized in occipital, frontal or generalized.

SEVERITY OF HEADACHE was assessed with standard Scale (Numerical Analogue Scale)

- Mild headache (while sitting or ambulant)
- Moderate headache (sitting position)
- Severe headache (when supine)

Other types of headache will be excluded from study.

RESULTS

The results of the study were analyzed with 'chi-square' test. A total of 100 patients admitted for lower limb and lower abdominal surgeries were included in the study as per inclusion and exclusion criteria. The study group divided into two groups based on the type of spinal needle used.

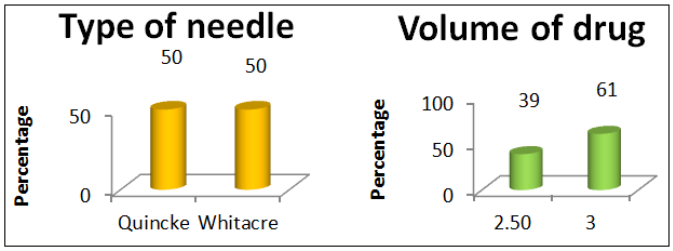

Table-1: Distribution According To the Frequency of Headache

Headache (p/a)	Frequency	Percent
Absent	92	92
Present	8	8
TOTAL	100	100

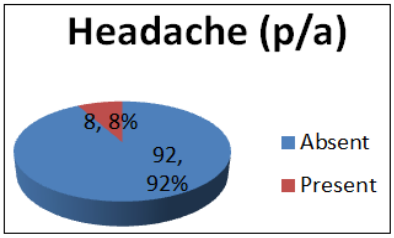

Table-2: Distribution of Male- Female sex based on spinal Needle Type

Sex	Type of needle				Total
	Quincke		Whitacre		
	N	%	N	%	
Male	27	52.94	24	47.06	51
Female	23	46.94	26	53.06	49
Total	50	50	50	50	100

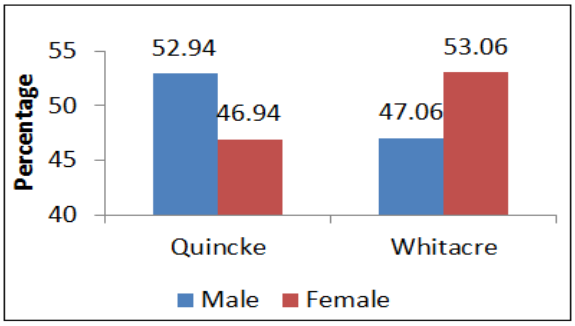

Table-3: Distribution of Spinal Needle According To the Type of Surgery

Type of surgery	Type of needle				Total
	Quincke		whitacre		
	N	%	N	%	
Lower Abdominal	25	80.65	6	19.35	31
Lower Limb	25	36.23	44	63.77	69
Total	50	50	50	50	100

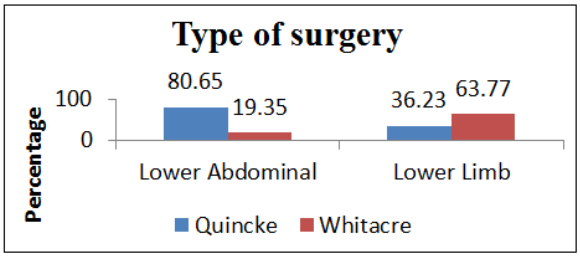

Table-4: Frequency of Headache Depending On Type of Needle

Headache (p/a)	Type of needle				Total
	Quincke		whitacre		
	N	%	N	%	
Absent	43	86	49	53.26	92
Present	7	14	1	12.50	8
Total	50	50	50	50	100

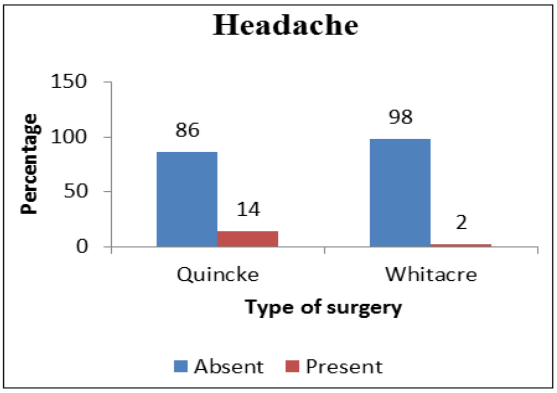

Table-5: Distribution of Study Group Based on Sex

Sex	Type of surgery				Total
	Lower Abdominal		Lower Limb		
	N	%	N	%	
Male	12	23.53	39	76.47	51
Female	19	38.78	30	61.22	49
Total	31	31	69	69	100

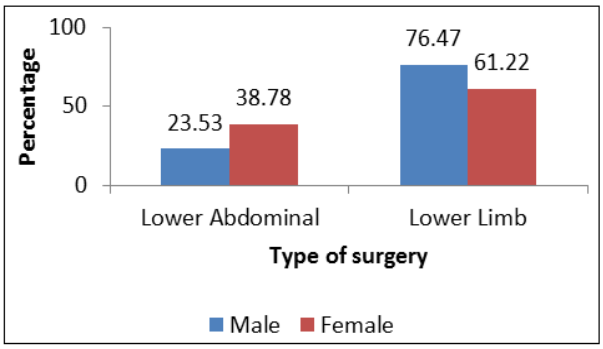

Table-6: Statistical Analysis of Headache Based on Sex

Sex	Headache				Total	Chi square	P
	Absent		Present				
	N	%	N	%			
Male	50	98.04	1.00	1.96	51	5.16	0.023*
Female	42	85.71	7.00	14.29	49		
Total	92	92.00	8	8.00	100		

*Significant at 5 %

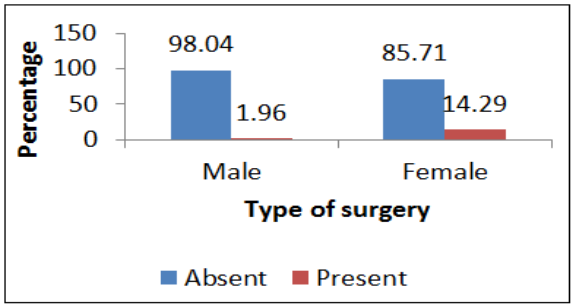

Table-7: Relationship between Headache and Type of Surgery

Type of surgery	Headache				Total	Chi square	p
	Absent		Present				
	N	%	N	%			
Lower Abdominal	25	80.65	6.00	19.35	31	7.87	0.005**
Lower Limb	67	97.10	2.00	2.90	69		
Total	92	92.00	8	8.00	100		

**Significant at 1 %

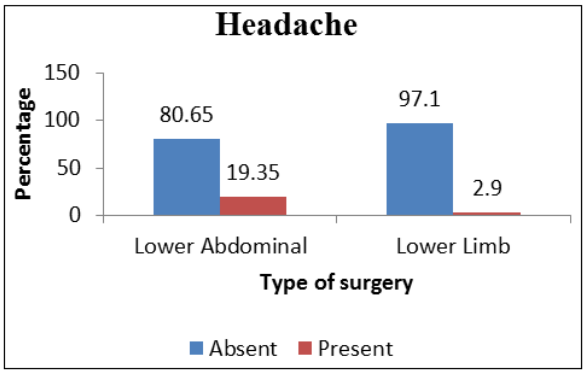

Table-8: Statistical Relationship between Type of Needle and Incidence of headache

Type of needle	Headache				Total	Chi square	p
	Absent		Present				
	N	%	N	%			
Quincke	43	86.00	7.00	14.00	50	4.89	0.027*
Whitacre	49	98.00	1.00	2.00	50		
Total	92	92.00	8	8.00	100		

*Significant at 5 %

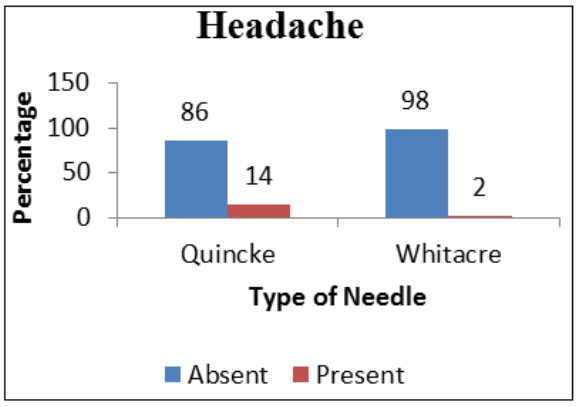

Table-9: Relation between Age, Weight and Volume of Drug with Headache

	Headache (p/a)	N	Mean	SD	t	p
Age	Absent	92	32.68	8.43	2.02	0.046*
	Present	8	26.63	2.56		
Weight	Absent	92	58.13	8.27	2.17	0.032*
	Present	8	51.63	5.85		
Volume of drug	Absent	92	2.80	0.25	0.09	0.929
	Present	8	2.81	0.26		

*Significant at 5 %

DISCUSSION

Regional anaesthesia particularly spinal anaesthesia has developed a lot since its introduction in the late 1800's. Spinal Anaesthesia is considered now as a superior choice in the regional anaesthesia. It is safe, reliable technique & cost effective. Spinal anaesthesia like other techniques is also associated with complications along with advantages. Post-dural spinal headache (PDPH) is important complication of this. Incidence of PDPH depends upon number of variables such as age of patient, sex, size, type & orientation of needle and the type of surgery performed. The frequency of PDPH ranges from 0% to 36%.

In our study 8 patients out of 100 (16.5%) developed headache. Among this 7 (14%) patients belonged to quincke group and 1 (2%) belonged to whitacre group. Study done by Maliket al found out the incidence of PDPH was 5 percent with 25 G Quincke Babcock spinal needle when used for lower abdominal & perineal surgeries. Incidence was more among females [1]. Large spinal needles will produce bigger defects in dura so chance of dural puncture headache is more in comparison with smaller needles which produce small dural defects & less incidence of headache [2]. This large bore needle was associated with an incidence of 70 percent where as advanced small size needles are less likely to produce higher incidence. In a study done by Weasel observed 12.8% incidence in pregnant patients when 27G Quincke needle was used [3]. The gauge of the needle was kept constant in this study. In our study we kept gauge size same.

The type of the needle used is loved factor and major determinant for PDPH. For 25G Quincke, incidence ranges from 3-25 percent while it is 0-14.5 percent for Whitacre needle of the same size. The reported results in the two groups are comparable with our study i.e. 14 % for 25G Quincke Babcock needle and 2 % for 25 G Whitacre needle.

Vallejo study on 1002 women undergoing elective cesarean spinal LSCS anaesthesia with different types of needle. The frequency of headache was 8.7% for 25G Quincke &3.1% for Whitacre needle of same size [4].

Mayer et.al in his study used 27 G quincke spinal needle found there is no statistically significant difference between Quincke and Sprotte spinal needles [5]. But study showed major reduction in headache when Whitacre spinal needle used.

Number of puncture attempts can be reduced by the experience of the anaesthetist. Experienced anaesthetist is likely to introduce needle in the subarachnoid space in fewer attempts. Spinal anaesthetic was delivered to all the patients included in our study by same anaesthesiologist in single puncture attempt.

Apart from pregnancy, higher rates of PDPH seen in young and especially females. Wadud recorded 30% occurrence in young individuals (30-50 yrs) and higher percentage (40%) in females compared with males (20%). In our study higher incidence of headache as among females (14.29%) compared to males (1.96%) [6].

Treatment options for Post dural puncture headache includes simple measures such as adequate hydration, NSAID'S to complex procedures as epidural blood patch. Simple measures are very effective in managing most cases of PDPH. In our study NSAID's, hydration & adequate rest relieved headache in patients.

CONCLUSION

PDPH is not a rare complication. There is statistically significant difference in the development of PDPH when pencil point spinal needles like Whitacre than cutting spinal needles like Quincke needles are used. Pencil point needles are associated with a lesser frequency of post-dural puncture headache as compared to cutting needles of the same gauge. Headache was more among young females compared to males.

SUMMARY

PDPH is post spinal sequelae of spinal anaesthesia which should not be taken lightly. There can be potential morbidity and even death in some cases. In majority, the problem will settle spontaneously but in some the headache will last for months and years. Therapies which are offered for treatment of PDPH is not always arisen by the application of logic & reasoning. Gormley's observation that bloody taps are less likely associated with headache probably incorrect had led to the widespread application of epidural blood patching in the treatment of post-dural spinal headache. The benefit of prophylatic blood patching is not that clear but deserves importance in those at increased risk of headache such as a parturient after accidental dural puncture by Tuohys needle but there are occasions in which blood patches are not effective in treatment of headache. It is always important to consider other causes of headache before application of alternative therapies for PDPH.

In our study we concluded that non cutting needle like25 gauge whitacre produces a Statistically Significant difference ($p<0.05$) of incidence of post dural puncture headache than cutting spinal needle like 25 gauge quincke needle.

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