

DO ANAESTHESIOLOGISTS PREFER WHITACRE NEEDLE OVER QUINCKE FOR LUMBAR SUBARACHNOID BLOCK? AN ANALYTICAL STUDY

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ABSTRACT

BACKGROUND

A study to analyse Anaesthesiologist's preference of Whitacre and Quincke needles for lumbar subarachnoid block. Whitacre needle is not routinely used in spite of its advantages like decreased incidence of post-dural puncture headache because of its unfamiliarity among Anaesthesiologists and its low ease of availability.

MATERIALS AND METHODS

An analytical study was done in 100 ASA 1 and 2 patients undergoing lumbar subarachnoid block for elective inguinal hernia surgery conducted over a period of 10 months. 20 Anaesthesiologists with more than 5 years clinical experience performed lumbar subarachnoid block. 50 cases were each allotted to the Whitacre group (Group 1) and the Quincke group (Group 2). The ease of using the 2 different spinal needles and the number of attempts at successful dural puncture was noted and feedback obtained from the Anaesthesiologists.

RESULTS

All Anaesthesiologists who used the Whitacre needle were familiar with the Quincke needle as they used it in their day-to-day practice. Some of the Anaesthesiologists were using Whitacre needle for the first time. Whitacre needle showed a greater ease of insertion compared to Quincke needle, reported by 19 out of 20 Anaesthesiologists involved in the study. 19 Anaesthesiologists out of 20 (95%) said they would prefer Whitacre needle given the option. It was seen that in 40 (80%) of the 50 cases where Whitacre needle was used, procedure was successful in the first attempt whereas in Group 2 (Quincke), 30 (60%) cases were successful in the first attempt. In 2 cases where Whitacre needle was used there was difficulty in obtaining a successful tap and Quincke needle was used successfully subsequently.

CONCLUSION

Whitacre needle showed superior ease of insertion and was preferred by majority of Anaesthesiologists given a choice. The introducer needle which is used with the Whitacre needle may be the reason for its reduced manoeuvrability in a difficult spine.

KEYWORDS

Lumbar Subarachnoid Block, Anaesthesiologist's Preference, Quincke Needle, Whitacre Needle.

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BACKGROUND

Postoperative patients sometimes suffer post-dural puncture headache (PDPH) after a lumbar subarachnoid block (LSAB), which may cause great distress to these patients who also have to deal with postoperative pain.^{1,2} Type of needle used for lumbar subarachnoid block contributes to PDPH.³ Whitacre needle is found to be much superior to Quincke needle in reducing the incidence of PDPH⁴, even though Quincke needle is used more commonly in performing lumbar subarachnoid block. Whitacre needle is not routinely used in spite of its advantages, possibly because of its unfamiliarity among Anaesthesiologists and Neurologists⁵ and its limited availability.

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Studies analysing preference of Anaesthesiologists between Quincke and Whitacre needles are limited. The reason for less frequent use of Whitacre needle is worth analysing as its advantages over Quincke is well established in scientific literature.⁴ Since many of the Anaesthesiologists are unfamiliar with Whitacre needle, this study was aimed at analysing the ease of insertion of both needles and getting the feedback from them regarding their preference.

MATERIALS AND METHODS

After obtaining Institutional Ethical Committee approval, 100 consenting adults of ASA I & II status undergoing elective hernia repair below the umbilicus were enrolled in the study which was undertaken for a period of 10 months. To eliminate any bias due to inexperience on the part of the performer, 20 Anaesthesiologists with more than 5 years experience after their qualifying exam were enrolled in the study to perform lumbar subarachnoid block. All Anaesthesiologists were well versed in using the Quincke needle in their day-to-day clinical practice. 25 G Whitacre and 26 G Quincke needles were used in this study. These were chosen as they had comparable gauges. The lesser the size, the lesser is the resistance offered by the tissues in the path to the needle during LSAB⁶ and lesser adverse effects.

The patients selected were aged between 20 to 70 years, weighing 45 to 80 kg and a height of 150-180 cm and all the parameters were comparable between the 2 groups. After applying the exclusion criteria, 50 patients each were allocated into two groups randomly, according to lots taken by the Anaesthesiologist performing the lumbar puncture. The groups were assigned as Group 1 (Whitacre group) and Group 2 (Quincke group). Standard protocol for lumbar subarachnoid block was followed in each case.⁷ Lactated Ringers solution infusion was started using a wide bore cannula. All mandatory monitors like ECG, SPO₂, Noninvasive BP were attached. Oxygen was supplemented with a face mask. Premedication was given with Inj. Midazolam 1 mg intravenously. After positioning the patient and applying strict asepsis, 2 cc of 2% lignocaine was injected into the L3-L4 or L2-L3 space for local anaesthesia. By median approach, using either 25 G Whitacre or 26 G Quincke needle, 3 to 3.5 cc of 0.5% bupivacaine heavy was injected into the subarachnoid space after ensuring free flow of CSF. 25 G Whitacre needle being a pencil point needle comes with an introducer as it is difficult to negotiate the tough superficial tissues with the needle alone. The number of attempts to attain positive dural puncture and ease of using the spinal needle were noted down by the Anaesthesiologists performing the procedure.

Each Anaesthesiologist had 5 chances to perform lumbar subarachnoid block and it was observed that each anaesthesiologist got at least two attempts with the Whitacre needle. The proformas were filled only after the Anaesthesiologists had used both types of needles at least once. The proforma was questionnaire based, which included questions on number of attempts to obtain a successful tap, and the ease of the procedure. "Ease" was defined as obtaining a successful lumbar puncture with minimum manipulations in the first attempt itself. The feedback of the Anaesthesiologists were also obtained regarding their preference of needle once they had been initiated into the use of Whitacre needle. Difficulties encountered during the use of either of the needles were recorded and the opinion of the participants were sought regarding the failure of the procedures, if any.

RESULTS

100 patients were enrolled in this study. In Group 1, there were 37 males and 13 females while in Group 2 there were 40 males and 10 females. Both groups were comparable with respect to age, weight, height and sex.

Patient Characteristics	Group 1 (Whitacre Group) (n=50)	Group 2 (Quincke Group) (n=50)
Age(Years)	48.1±11.9	48.9±11.2
Body weight(Kg)	65.2±5.8	64.9±6.2
Height (cm)	163.3±8.6	163.9±8.2

Table 1: Demographic Data

*Values expressed as mean ± SD; n-number of patients; SD-standard deviation.

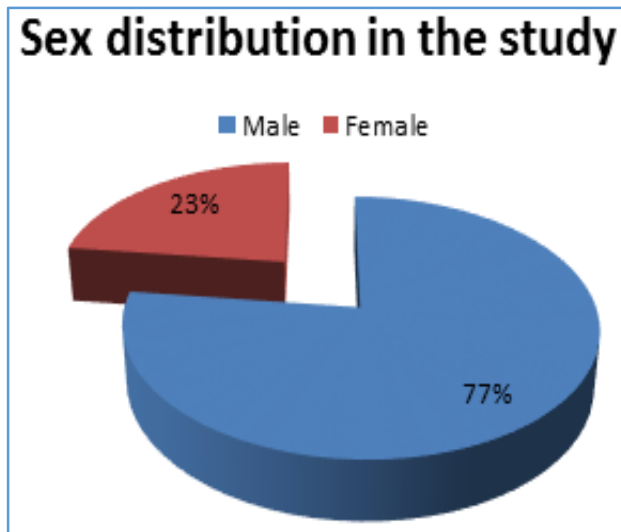


Fig. 1

23% of the patients were females and 77% of the patients involved were males.

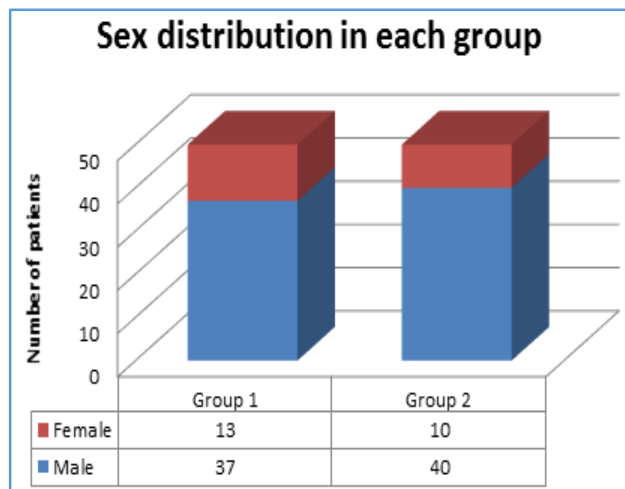


Fig. 2

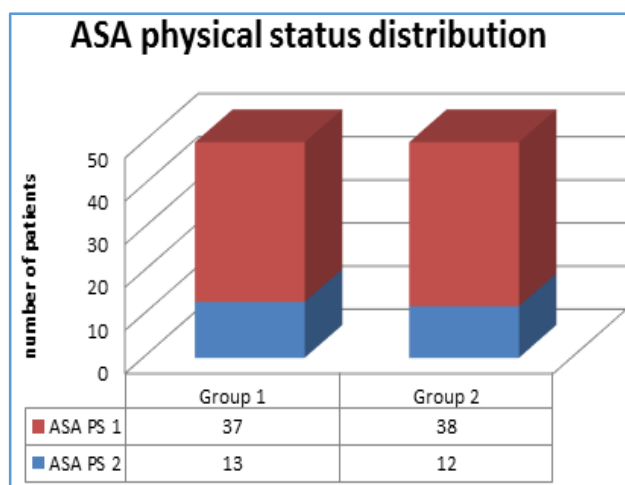


Fig. 3

EXPERIENCE OF ANAESTHESIOLOGISTS

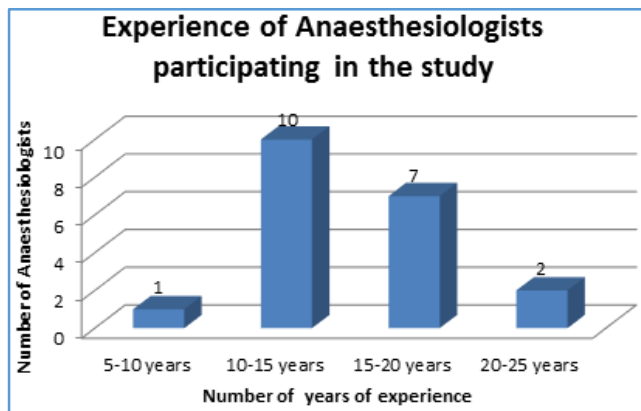


Fig. 4

All 20 Anaesthesiologists had more than 5 years experience out of which 19 of them had more than 10 years of experience.

Number of Attempts taken for Successful LSAB

In Group 1(Whitacre), of the 50 procedures done, 40(80%) were successful in the first attempt and 8(16%) in the second attempt .2 (4%) cases were failures (i.e. no positive CSF tap after 3 attempts). In these 2 cases, 23 G Quincke needle was used subsequently and proved to be successful. In Group 2 (Quincke) of the 50 procedures done 30(60%) of them were successful in the first attempt, 14(28%) in the second attempt and 6(12%) in the third attempt.

Number of Attempts	Group 1 (Whitacre)	Group 2 (Quincke)
1	40	30
2	8	14
3	0	6
Failed	2	0

Table 2: Number of Attempts taken for Successful Subarachnoid Puncture

Ease of Insertion

From the feedback form obtained from the Anaesthesiologists it was seen that out of 20 participants, 19 of them opined that Whitacre needle was easier to use compared to Quincke needle in performing LSAB. The one participant who preferred Quincke needle over Whitacre opined that the failure of the procedure in that particular case might have been due to anatomical variation in the patient and the introducer needle along with the Whitacre may also have limited the manoeuvrability inside the intervertebral space.

DISCUSSION

Lumbar subarachnoid block is a commonly performed procedure by Anaesthesiologists⁸. Although it has been in practice for a long time, newer varieties of needles are in use now a days with which incidence of adverse effects have drastically come down.⁹ These new needles have revolutionised the techniques of the procedure because of which the success rate of the procedure has also improved.^{9,10} Most Anaesthesiologists are familiar with Quincke needle which is commonly available in many of the hospitals. In spite of the better features of newer needles like Whitacre, Quincke is possibly the preferred needle due to its easy availability and lesser cost.⁹

LSAB is a blind procedure which solely depends on the give way feel experienced by the anaesthesiologist to the advancing needle.¹¹ Hence, a successful LSAB will require a perception of give way to resistance offered by the tissues juxtapositioned between the skin and the arachnoid matter. Whitacre needle being a pencil point needle offers greater feel of resistance to the advancing hand and thus creates a greater feel of give way when it crosses the ligamentum flavum which may contribute to a successful CSF tap in the first attempt itself. Quincke needle, on the other hand is a cutting needle. It easily cuts through the tissues, thus offering lesser resistance along the path of the needle, making it difficult to experience the give way feel. The difficulty in experiencing the give way is further increased by the decreasing size of the needle.⁶ Smaller size needles are increasingly being used nowadays due to its advantages like lesser incidence of PDPH.¹² Therefore, the experience of the anaesthesiologist plays an important role in obtaining a positive CSF tap in the first attempt itself.¹³ All 20 Anaesthesiologists who participated in this study had more than 5 years' experience in the procedure out of which 19 of them with more than 10 years of experience, which could eliminate the possibility of experience bias.¹⁴ Experience of the anaesthesiologist may also have avoided the chance of overshoot of the Whitacre needle mentioned in literature.¹³⁻¹⁵ The better feel of loss of resistance while using the Whitacre needle may have contributed to the opinion from the majority of the Anaesthesiologists (19/20) that Whitacre needle provided better ease of insertion, despite the fact that some of them were using it for the first time. This could be the reason for more successful CSF taps in the first attempt in Group 1 (Whitacre). Lesser attempts result in better patient comfort and lesser complications following LSAB.¹⁶

All LSABs may not be a cake walk. Difficulties encountered while doing the procedure may be due to difficulty in positioning the patient, apprehensive patient¹⁶, abnormal spinal anatomy¹¹, body habitus of the patient¹⁵ to name a few. 25 G Whitacre needle comes with an introducer needle. So in cases where there is difficulty in locating the subarachnoid space, the manoeuvrability of the Whitacre needle might be limited within the space due to the introducer needle. Failed spinal anaesthesia defined as dry tap¹⁶ even after 3 attempts occurred in 2 cases in Group 1. This may have occurred due to the above-mentioned patient characteristics added on by the decreased manoeuvrability of the Whitacre needle as opined by the 2 Anaesthesiologists in their feedback form. In both these cases, the anaesthesiologist had to revert back to a wider gauge (23 G) Quincke needle which he/she was more familiar with and which afforded more manoeuvrability within the intervertebral space. In both cases, they were able to tap CSF, but with difficulty.

CONCLUSION

Whitacre needle renders greater ease of insertion and successful CSF tap in lesser attempts. This can lead to better patient comfort and lesser complications. Thus, Anaesthesiologists who are exposed to both types of needles may prefer Whitacre needle over Quincke. But, in difficult lumbar subarachnoid block situations, the decreased manoeuvrability of the Whitacre needle may limit its use. Lack of availability and relatively higher cost may be the limitations in its use in routine practice in developing countries.

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