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Comparison of General and Spinal Anesthesia in Patients Undergoing Total Hip Arthroplasty

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ABSTRACT

Background and Objectives: Total hip arthroplasty can be performed under spinal and general anesthesia. The aim of this study was to compare general versus spinal anesthesia and to investigate advantages and disadvantages, the pain control, length of stay, perioperative and post operative result related to complications.

METHODOLOGY: The study was conducted in the slum vicinity near The University of Lahore adjacent to Raiwind, Lahore. The perception of health hazards among Ragpickers was assessed hrough a proforma before the start of the study. The Snowball technique was used to collect data. An analysis among the same population was done two weeks later after being given awareness about health hazards. The data was analyzed using chi-square and McNamara Test with p-value <0.05 considered as significant.

RESULTS: The results show that amongst the 150-sample population, the awareness level of the subjects increased by 50% about all diseases, but the knowledge about personal hygiene practices remained unchanged. Only 9% were aware of the diseases tetanus, and none of them was aware of hepatitis, etc.; however, after counseling, they became aware of the common hazards encountered during such work. The awareness level increased significantly (P<0.001). The data was analyzed using chi-square and paired sample t-tests with p-value <0.05 considered as significant.

CONCLUSION: There was a prominent lack of awareness in the ragpickers included in the study, and after the intervention, they showed a greater understanding of infectious diseases. Through health care programs sponsored by the government and NGOs, significant improvement in health among Ragpickers could be seen by following simple hygiene principles.

KEYWORDS: Disease, Needle, Garbage, Medical Waste, Awareness.

INTRODUCTION

Total hip arthroplasty (THA) is defined as complete and permanent loss of femoral head from the acetabular socket.(1, 2)There are two stages of total hip arthroplasty; Comparing one-stage bilateral THA to two-stage bilateral THA.(3)Dislocations come in two varieties: acquired and congenital. When a fetus is positioned against the mother's abdominal wall in pregnancy or when a dysplastic hip Joint is in flexion, the result is a congenital dislocation. acquired is linked to a variety of circumstances, like as motor vehicle crashes.(2)

The risk factors of total hip arthroplasty includes osteoarthritis, inflammatory arthritis, comorbidities longer or smaller femoral head size.(4)when patient is not responding to cooperative treatment for arthritis THA is effectively reduced pain.(5)The predisposing factors of total hip arthroplasty includes lumbar spinal abnormalities, developmental hip dysplasia (DDH), osteoarthritis (OA), and HIV that are associated with this condition.(6)The main cause of pain and disability is osteoarthritis (OA), one of the main chronic diseases.(7)

The incidence of hip osteoarthritis was unimodally

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distributed in 1990 and 2019, peaking in the 60–64 age range, but the number of disability-adjusted life years (DALYs) rose with age.(8)Preoperative testing is an important part of preoperative assessment. It includes the white blood cells count (WBC) , basic metabolic panel which includes (BUN) Blood urea nitrogen, sodium and creatinine levels and Erythrocyte sedimentation rate (ESR).(9)

It is important to choose adequate anesthetic technique for THA. Historically GA was dominant but now spinal anesthesia gained popularity.(10) spinal anesthesia has been linked to a lower rate of morbidity than general anesthesia.(11, 12)Spinal anesthesia is associated with decrease in blood loss, surgical site infections, and the need for critical care services.(13, 14)Even though spinal anesthesia produces superior perioperative results than general anesthesia. Spinal anesthesia is a remarkable gold standard tool. There are some absolute contraindications to SA such as patient refusal, spinal pathology, coagulopathy) etc.(15)Neuraxial anesthesia shows significantly reduced length of stay as compared to general anesthesia.(16, 17)Neuraxial anesthesia have favorable patient outcomes in terms of the perioperative physiological parameters. Reductions in hospital stays and respiratory problems, as well as a drop in postoperative cognitive dysfunction (POCD).(18, 19)Spinal anesthesia have better results than propensity matched GA.(20).

METHODOLOGY

Comparative cross-sectional study at Orthopedic department Jinnah Hospital Lahore. The duration of the study was 6 months after approval of synopsis. The participants was selected as per the inclusion and exclusion criteria. The inclusion criteria was , both gender, age 40 to 80 years , healthy patient with no cardiopulmonary condition, no history of sleep apnoea and no history of deep venous thrombosis(DVT),no history of coronary artery disease , and no chronic history of anti-coagulation, patients willing to agree on the consent form will be included. And the exclusion criteria was patients with chronic co-morbidities , patients with ASA class 3 and 4.The sampling technique was convenient sampling technique, and the sample was calculated with 95% confidence level, by using Epitool which is 366. The outcome measures that will be used for the evaluation of study parameters. The primary outcome measures are , the assessment of duration of by time measuring, the quantity of blood loss measured in ml, the need of of blood transfusion measuring by hemoglobin(Hb) and number of blood bag.

And the evaluation of nausea vomiting events.The secondary outcomes were the assessment of post-operative pain by numeric pain rating scale(NPRS) length of stay by counting hours and days and the evaluation of nausea and vomiting, and the evaluation of any adverse events post-operatively.

The self-structured data collection tool will consist of the questionnaire form that Contains the demographic data (age, gender, height, weight, BMI), screening tool and Outcome measures tool.

After obtaining letter from the ethical committee, the patients will be asked to sign the Consent form to enroll them into study, and then the patients will be divided into two Group i.e. group A (general anesthesia) and group B (spinal anesthesia). After Allocating the patients to the respective groups, they will be given anesthetic Technique. SPSS version 26 will be used for the analysis of data.

The normality of data will be Assessed by Shapiro-Walks test and then parametric tests (repeated measure ANOVA, Independent t-test) or non-parametric tests (Friedman test, Mann-Whitney U test) will be applied.

Prior to the study the ethical approval will be gained from The University of Faisalabad, the participants will be given the details of the study orally and the consent forms will be signed from each participants.

The participants will be enrolled depending upon their own will, the benefits and risks will be briefed to them.

The participants will be given assurance about the security of data that it would be lock protected into the system.

RESULTS

The results showed that Spinal anesthesia offers significant benefits specific to THA that make it a preferred choice in many cases. One of the primary advantages is its superior postoperative pain control. By directly targeting the nerves responsible for sensation in the lower body, spinal anesthesia provides effective pain relief during and after surgery, potentially reducing the need for opioid medications postoperatively. This is particularly beneficial in the context of THA, where early mobilization and pain management are crucial for recovery and rehabilitation.

Moreover, spinal anesthesia is affiliated with fewer respirator complications Contrasted to general anes

thesia. In GA, the patient is fully unconscious and reliant on artificial ventilation, which can lead to complications such as airway issues, lung Infections, and prolonged recovery times. In contrast, spinal anesthesia allows the

Patient to breathe independently and maintain natural respiratory function, lowering the risk of these complications.

Table-1: Frequency of Pain Control in patients with general and spinal anesthesia.

Surgical Technique	YES	NO	Total
GA	96	87	183
SA	125	58	183
Total	221	145	366

Table-2 Frequency of Length of stay in patients with general and spinal anesthesia

Surgical Technique	less	Increase	Total
GA	69	114	183
SA	149	34	183
Total	218	148	366

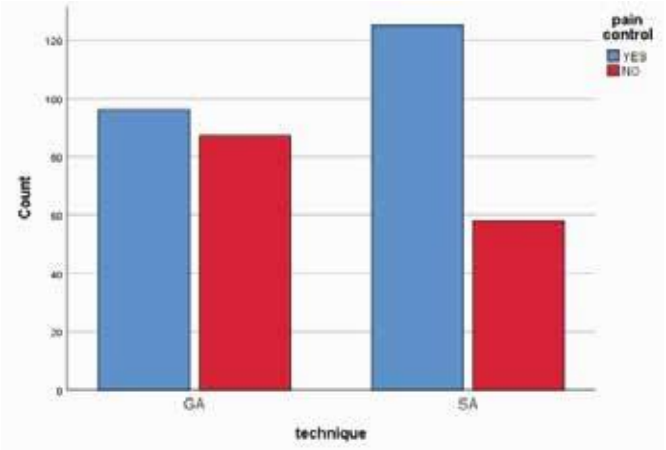

Figure-1 Determine the pain control in patients with general and spinal anesthesia.

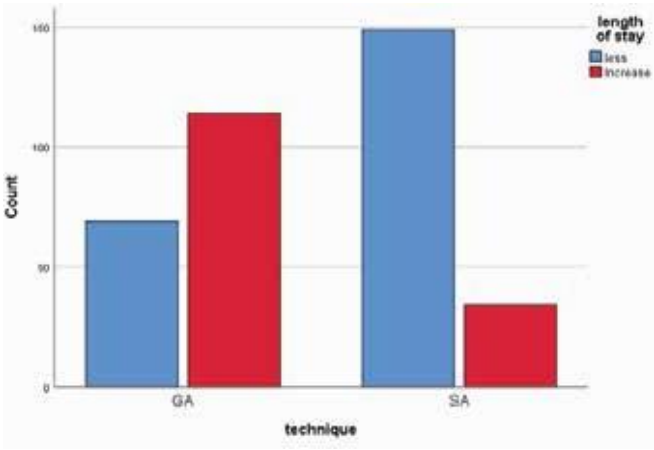

Figure-2 Determine length of stay in patients going through total hip Arthroplasty.

DISCUSSION

Total hip arthroplasty (THA) can be carried out under either spinal or general anesthesia, each with its own set of benefits and drawbacks.THA is a common surgical procedure to relieve pain and restore function in patients with severe hip arthritis, can be carried out under either spinal or general anesthesia. Spinal anesthesia has several advantages over general anesthesia for THA.

Spinal Anesthesia provides targeted pain relief by numbing the specific nerves supplying the hip,leading to superior pain control during and after surgery.This reduces the need for opioids, minimizing opioid-related side effects.It also reduces the risk of respiratory depression(use of ventilator for more than forty eight hours), as it avoids the need for endotracheal intubation and mechanical ventilation. Patients experience fewer side effects such as nausea and vomiting.Spinal Anesthesia provides more stable intraoperative hemodynamics, reducing the risk of cardiovascular complications like hypotension and arrhythmias.Faster recovery and earlier participation in physical therapy due to better pain control is seen in patients who underwent spinal anesthesia. This leads to shorter hospital stays and a quicker return to daily activities. Lower risk of postoperative cognitive dysfunction, particularly beneficial for elderly patients are found in use of spinal anesthesia. Patients remain more alert and recover cognitive functions faster in case of spinal anesthesia. General Anesthesia often results in a longer recovery period due to systemic pain management and slower mobilization, leading to extended hospital stays. Patients with general anesthesia have to take systemic pain medications postoperatively to manage pain, increasing the risk of side effects like nausea, vomiting, and opioid dependence, chronic pain and Inflammation.

General Anesthesia involves a higher risk of respiratory complications like pneumonia and atelectasis due to the use of intubation and mechanical ventilation.

Postoperative nausea and vomiting are more common.General Anesthesia can cause fluctuations in blood pressure and heart rate, increasing the likelihood of cardiovascular events during surgery.

CONCLUSION

In comparing spinal and general anesthesia for total hip arthroplasty, spinal anesthesia demonstrates clear advantages. It offers superior pain management, reduces systemic and cardiovascular complications, supports faster recovery, and preserves cognitive function. Additionally, it lowers the risk of chronic pain

and inflammation, is more cost-effective, environmentally friendly, and results in higher patient satisfaction. Although patient-specific factors must guide the final anesthetic choice, the benefits of spinal anesthesia make it a preferred option for many undergoing THA.

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Khadeeja Zameer: Substantial contributions to the conception and design of the work.

Rimsha Abid: Design of the work and the acquisition. Drafting the work. Final approval of the version to be published.

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