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COMPARISON BETWEEN EARLY AND DELAYED MOBILIZATION ON INCIDENCE OF POST-DURAL PUNCTURE HEADACHE AFTER SPINAL ANESTHESIA

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Abstract

Objective: *To compare the incidence of post-dural puncture headache (PDPH) in female patients between early and delayed mobilization post elective caesarian section delivery under spinal anesthesia*

Place and Duration of Study: *Anesthesia department of Combined Military Hospital, Rwp from Jun 2022-Dec 2022*

Study Design: *Quasi-experimental study*

Methodology: *The patients were divided into the EM (early mobilization) group (n=400) and the DM (delayed mobilization) group (n=400). Primary variable measured was incidence of PDPH between both groups assessed till 5 days post-delivery. Secondary variables measured were fluid given, need for anti-emetics and patients who subsequently required blood patch.*

Results: *Comparison of incidence of PDPH between both groups showed incidence in 35 (8.8%) patients in Group EM versus 45 (11.3%) patients in Group DM (p=0.239). Mean total fluid given till discharge in both groups was 5.73±0.60 liters in Group EM versus 5.71±0.60 in Group DM (p=0.640). The need for anti-emetics was required in 86 (21.5%) patients in Group EM versus 52 (13%) patients in Group DM (p=0.001). The frequency of patients requiring blood patch were 10 (2.5%) in Group EM versus 08 (2.5%) in Group DM (p=0.634)*

Conclusion: *We conclude that incidence of PDPH in early and late mobilization for patients undergoing caesarian section under spinal anesthesia are statistically comparable.*

INTRODUCTION

Caesarian section is one of the commonest surgical procedures done worldwide. With the incidence decreasing in developed countries, the percentage is still very high in the developing world[1]. The complication mostly seen in females after Caesarian delivery is post-dural puncture headache (PDPH)[2]. Various factors have been identified with increase the incidence including poor fluid status per-operatively, type of needle used, number of attempts at spinal anesthesia administration, obesity, and female gender[3].

It is established that good fluid status decreases the incidence, and the chances are less when using Whitacre and pencil point spinal needles versus Quincke needles for spinal administration[4]. The cost effectiveness of the more expensive needles restricts their broad use in patients in developing

countries due to resource constraints on the already crippling healthcare system. With the use of the Quincke needle, the incidence of PDPH is as high as 11% in patients between 31-50 years of age[5]. It is less in young patients and more in patients with extreme of ages. The healthy parturient falls in the younger category of patients and prevention of PDPH is essential for the anesthetist since it results in significant patient discomfort, problems in breast-feeding the newborn and prolonging hospital admissions ultimately requiring a blood patch as the gold standard treatment in some cases[6].

The protocol of early and late mobilization has been a constant topic for debate in patients undergoing spinal anesthesia or lumbar puncture procedures. While studies show no difference in results between both where lumbar puncture is considered, results in literature are divided when surgeries and especially caesarian section patients post-spinal administration are concerned[7]. Since the protocol is easy to follow, doesn't require staff training or advance expertise, we aim our study to see the results in our demographic area to see which strategy should be adopted in patients for the nest results and patient satisfaction. We aim to compare the incidence of post-dural puncture headache in female patients between early and delayed mobilization post elective caesarian section delivery under spinal anesthesia.

METHODOLOGY:

This quasi-experimental study was carried out at the Department of Anesthesiology, Combined Military Hospital, Rawalpindi from Jun 2022-Dec 2022 after approval form the ethical review board vide letter no. The sample size was calculated keeping the confidence inter at 95%, margin of error at 5% with the incidence of developing PDPH between the early and late mobilization group being 55.2% and 21.2% respectively[8]. Sample size for both groups came out to be 379 and 257 patients respectively. We included 400 patients in each group using non-probability consecutive sampling via lottery method according to the inclusion criteria furnished in the final study protocol (Figure-I).

Inclusion criteria included all ASA I and II female patients between 18-35 years of age presenting for uncomplicated caesarian section delivery under spinal anesthesia.

Exclusion criteria included patients with history of back pain, surgeries of the spine, coagulation disorders, advanced cardiac and respiratory disease, patients with known allergy to lignocaine or bupivacaine, patients converted to general anesthesia during surgery, patients suffering from migraine or other headache disorders and patients unwilling to be included in the study.

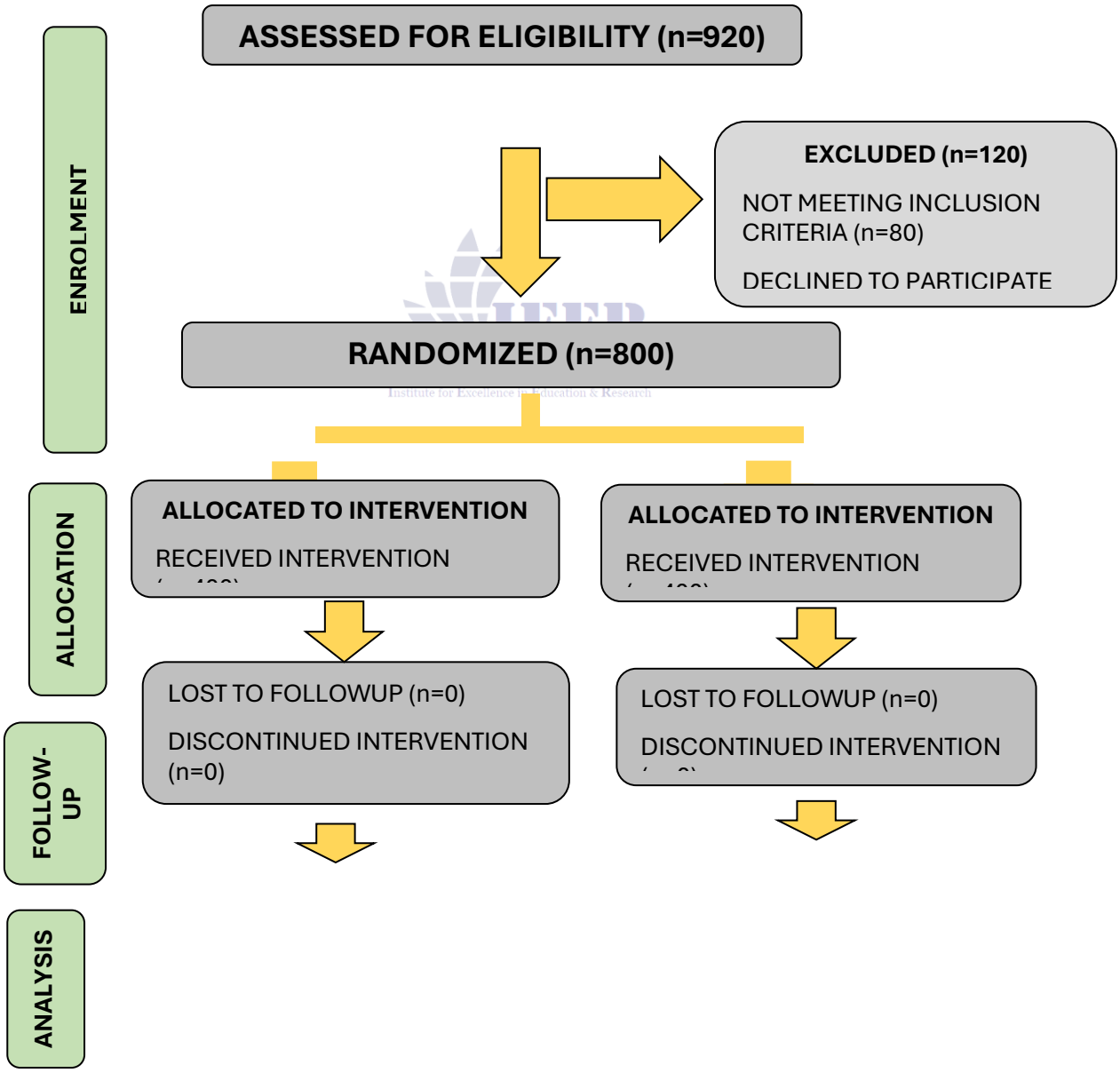
The study method included all patients as per the inclusion criteria furnished. The patients were divided into the EM (early mobilization) group (n=400) and the DM (delayed mobilization) group (n=400). The method of sampling was non-probability consecutive sampling via lottery method. This was a double blind study and the anesthetist doing the procedure and those assessing in the wards were unaware of the study protocol.

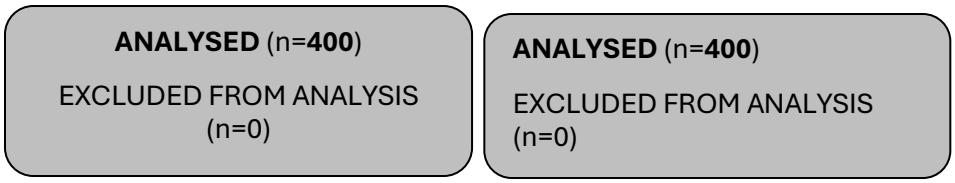
Patients in both groups received 500 ml normal saline as pre-load fluid in the recovery room and injection Ondansetron 4 mg an anti-emetic. All the patients were thoroughly counselled regarding the procedure and complications and advised to be monitored for three days following the caesarian delivery in the ward. Spinal anesthesia was given as a standard dose of 0.5% hyperbaric Bupivacaine, 2.5 ml at a speed of 0.2ml/sec. A standard 25 G Quinke needle was used for all participants with the spinal dose given in the L3-L4 space. The effectivity of spinal was checked with cold ethyl chloride spray for sensory and Bromage scoring[9] for motor block. Once shifted to the ward, patients in Group EM were mobilized after 6 hours when the effect of spinal anesthesia had worn off completely. Patients in Group DM were mobilized after 12 hours respectively. The patients remained admitted for three days and onset of headache radiating to the occipital area or bifrontal area with neck stiffness associated with nausea, vomiting and intolerance to light and sounds was classified as PDPH in line with International Classification of Headache Disorders criteria for diagnosis of PDPH[10]. Patient who developed headache within 5 days were

advised to follow up in the OPD and were assessed accordingly. Patients with diagnosed PDPH were advised standard regimen course of oral treatment for five days failing which a blood patch was offered and administered. Primary variable measured was incidence of PDPH between both groups assessed till 5 days post-delivery. Secondary variables measured were fluid given, need for anti-emetics and patients who subsequently required blood patch.

Demographic data were statistically described in terms of mean ± SD, frequencies, and percentages where appropriate. Mean values were compared using the independent samples t-test. Frequency variables were compared using the Chi-square test. A p value of <0.05 was considered statistically significant. All statistical calculations were performed using Statistical Package for Social Sciences 26.0.

FIGURE-I: PHASES OF THE STUDY





RESULTS:

A total of 800 patients were assessed in the final study protocol divided into the EM group (n=400) and DM group (n=400). Mean age of patients was 23.93±1.95 years in Group EM versus 24.05±2.09 years in Group DM (p=0.401). Mean weight was 85.56±3.47 kg in Group EM versus 85.62±3.49 kg in Group DM (p=0.823). Mean duration of surgery was 85.48±3.51 minutes in Group EM versus 85.52±3.54 in Group DM (p=0.873) (Table-I).

Comparison of incidence of PDPH between both groups showed incidence in 35 (8.8%) patients in Group EM versus 45 (11.3%) patients in Group DM (p=0.239). Mean total fluid given till discharge in both groups was 5.73±0.60 liters in Group EM versus 5.71±0.60 in Group DM (p=0.640). The need for anti-emetics was required in 86 (21.5%) patients in Group EM versus 52 (13%) patients in Group DM (p=0.001). The frequency of patients requiring blood patch were 10 (2.5%) in Group EM versus 08 (2.5%) in Group DM (p=0.634) (Table-II).

TABLES

TABLE-I DEMOGRAPHIC CHARACTERISITICS BETWEEN BOTH GROUPS (n=800)

VARIABLE	EM GROUP (n=400)	DM GROUP (n=400)	p VALUE
MEAN AGE (YEARS)	23.93±1.95	24.05±2.09	0.401
MEAN WEIGHT (KG)	85.56±3.47	85.62±3.49	0.823
MEAN DURATION OF SURGERY (MIN)	85.48±3.51	85.52±3.54	0.873

TABLE-II COMPARISON OF PRIMARY AND SECONDARY VARIABLES (n=800)

VARIABLE	EM GROUP (n=400)	DM GROUP (n=400)	p VALUE
INCIDENCE OF PDPH	35 (8.8%)	45 (11.3%)	0.239
MEAN TOTAL FLUID GIVEN DURING ADMISSION (LITERS)	5.73±0.60	5.71±0.60	0.640
NEED FOR ANTI-EMETICS	86 (21.5%)	52 (13%)	0.001
PATIENTS WITH PDPH REQURING BLOOD PATCH	10 (2.5%)	08 (2.0%)	0.634

DISCUSSION:

We carried out this study with the aim of standardizing protocols in our healthcare setup in obstetric cases post-caesarian delivery and shifted to the wards. Good fluid management, patient satisfaction, early mobilization, and early breastfeeding are some of the primary goals after shifting the patient to the ward[11]. The unique physiological dynamics of obstetric patients require continuous monitoring in the immediate post-operative period. Volume overload, gravid uterus, blood physiology all contribute towards the development of complications that need to be addressed before the patient can be safely discharged[7]. One of the most important parameters that needs assessment is the

mobilization of these patients, the passing of flatus and voiding to start normal oral intake along with starting breastfeeding for the newborn. The earlier the mobilization, the earlier can all these things be done effectively[12, 13].

The mechanism of post dural puncture headache is multifactorial and no one exact mechanism has been agreed upon that explains the pathophysiology of the condition. The accepted mechanisms proposed in literature include the persistent leakage of CSF from the dural hole created by the spinal needle resulting in decreased CSF pressure and changes in spinal canal leading to the development of headache[14]. The correction of this defect is the basis of blood patch to seal the opening and stop the leakage resulting is near instant relief of pain to the patient. This is why blood patch is considered the gold standard treatment for PDPH. Another mechanism proposed is reflex vasodilatation of meningeal vessels due to fall in CSF pressure leading to development of headache and another mechanism proposed is the traction of pain sensitive intracranial structures in the brain[15].

The role of mobilization post-spinal administration has been the topic of debate in literature for various surgeries and in various type of patients[8]. Obstetric patients especially in the age 25-40 are especially susceptible to development of PDPH. Various risk factors are more profound in the laboring patient ending in a caesarian section delivery which usually include poor hydration status, prolonged and exhaustive labor, increased physiological stress and the gravid uterus pressing on the spinal canal resulting in pressure changes in the meningeal vessels as well CSF. Delayed mobilization has been proposed to help and augment is healing and sealing of the dural puncture wound and decrease the incidence of PDPH but studies done by Schyns et al[16] and Uppal et al[17] found no difference in the incidence of PDPH which was in line with the results of our study as well. We did not find a statistically significant difference in the incidence of PDPH. The need for anti-emetics was significant in the early mobilization group due to the residual effect of pain killers and anxiolytics still persisting in the early mobilization group but compared with the benefits offered by early mobilization, the use of anti-emetics justify the benefit ratio offered[11]. Finally, the incidence of blood patch administration was nearly the same in both groups further strengthening that no difference exists when mobilization after 6 or 12 hours in these patients which is in line with international studies[18]. This study would help clinicians design local recovery protocols with more confidence resulting in early recovery for the mother, early removal of catheters and subsequent early discharges.

RECOMMEDATIONS:

The study recommends that early mobilization maybe preferred in patients with caesarian section done under spinal anesthesia since both early and late mobilization regimes offer statistically comparable incidence of PDPH.

CONCLUSION:

We conclude that incidence of PDPH in early and late mobilization for patients undergoing caesarian section under spinal anesthesia are statistically comparable.

LIMITATIONS:

The limitations are of a single center study. A multi-center would better help align results in our demographic setup. Studies in older age groups and different surgeries are needed to factor in the incidence with advancing age and type of surgery.

CONFLICT OF INTEREST:

None.

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