



A STUDY ON ANALGESIA PROVIDED BY ULTRASOUND GUIDED FASCIA ILIACA COMPARTMENT BLOCK WITH AND WITHOUT PARACETAMOL: EFFECT ON HEMODYNAMICS DURING INTUBATION

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ABSTRACT **INTRODUCTION:** Paracetamol acts by the inhibition of Cyclooxygenase (COX) mediated production of Prostaglandin unlike the non steroidal anti inflammatory agents, so it was found that tissue inflammation was not reduced. **METHODOLOGY:** A detailed pre-anaesthetic checkup carried out in each patient. Patient is kept nil per orally 6 hours prior to surgery, i.v line secured, pre medicated with Inj Ranitidine 50mg iv, Inj Ondansetron 4mg iv and IVF Ringer Lactate infusion at 100ml/hr 3 hours prior to surgery. **RESULTS:** Among the patients undergoing spinal anaesthesia in fracture femur surgery, there was no statistically significant difference in Blood pressure, Mean arterial pressure (MAP) between the groups. **CONCLUSION:** Among the patients undergoing spinal anaesthesia in fracture femur surgery, there was no statistically significant difference in Oxygen saturation (SpO₂) between the groups

KEYWORDS : Ultrasound Guided Fascia Iliaca Compartment Block, Hemodynamics, Paracetamol

INTRODUCTION:

Ultrasound uses sound waves to produce an image of structures through which they pass. Ultrasound waves are emitted from piezoelectric crystals present in the probe of the ultrasound transducer. When an electric current is applied to these crystals, they rapidly change shape and vibrate and emit ultrasound waves.¹ The process converts electrical energy into mechanical energy and is called reverse piezoelectric effect. These waves travel at different rates through tissues with different densities and return the signal back to the transducer. The crystals convert the mechanical energy of the returning echoes to an electric current (piezoelectric effect) that is converted into a two dimensional grayscale image. Hence the same crystals are used to send and receive the sound waves.^{2,3}

Paracetamol acts by the inhibition of Cyclooxygenase (COX) mediated production of Prostaglandin unlike the non steroidal anti inflammatory agents, so it was found that tissue inflammation was not reduced⁴.

In intact cells levels of arachidonic acid were found to be low so the potent inhibitory action of Paracetamol on Prostaglandin synthesis blocks the physiological regeneration of Peroxidase (POX)⁵.

In broken cells concentration of Hydroperoxidase was found to be high; hence Prostaglandin synthesis inhibited weakly. This explains the differential activity of Paracetamol in the brain where peroxide concentrations are low and in peripheral sites of inflammation the levels were high. Hence at the site of injured or inflamed tissue it provides highly effective analgesia and antipyretic effects; but there is lack of anti inflammatory and anti platelet activity⁶.

Another pathway of action is by the activation of descending serotonergic pathway. Paracetamol also has an endocannabinoid enhancement activity which explains the experience of relaxation, tranquility and euphoria reported in many users apart from the analgesic effects.

METHODOLOGY:

GROUP 1: Patients will receive ultrasound guided fascia iliaca compartment block with 30ml of 0.5% Ropivacaine with 30 min prior administration of 100ml NS I.

All patients with femoral fractures undergoing surgery under central neuraxial anaesthesia will be enrolled for the study. A detailed pre-anaesthetic checkup carried out in each patient. Patient is kept nil per orally 6 hours prior to surgery, i.v line secured, pre medicated with Inj Ranitidine 50mg iv, Inj Ondansetron 4mg iv and IVF Ringer Lactate infusion at 100ml/hr 3 hours prior to surgery. On arrival to Operation theatre, standard monitors including ECG, Pulse

oximeter, and non invasive blood pressure will be attached and baseline vital parameters will be recorded.

GROUP 2: patients will receive fascia iliaca block with 30ml of 0.5% of Ropivacaine with 30min prior administration of inj Paracetamol 1g. Central neuraxial anaesthesia will be performed in these patients after 30 minutes of giving block in lateral dependent position on the fractured site.

When a patient reported a NRS ≥ 4 during this positioning, the procedure was stopped, and 100 mcg of i.v. fentanyl was administered in both groups. Positioning was reattempted after NRS <4.

INCLUSION CRITERIA:

- Patients belonging to ASA grade I and II.
- Patients of either sex, between the age group 20 to 80 years.
- Patients with fracture femur, posted for surgery under sub-arachnoid block.
- Patients who give a valid informed consent.

EXCLUSION CRITERIA:

- Patients not satisfying inclusion criteria.
- Patients belonging to ASA grade III or IV.
- Patients with hemorrhagic diathesis, neurological disorders, psychiatric disorders.
- Previous femoral bypass surgery.
- Patients with allergy to local anaesthetics or paracetamol.
- Patients with polytrauma, infection over the injection site.
- Patients with liver diseases
- Morbid obesity.
- Patients who will be administered with supplementary epidural or general anaesthesia.
- Patients with spinal deformities.

Hemodynamic variables like heart rate, non invasive blood pressure, saturation of oxygen, respiratory rate were recorded prior to administration of inj paracetamol or 0.9%NS, when shifted to the operation room, after FICB block, at five minutes intervals till positioning.

RESULTS:

Table 1: HEART RATE

	BASE LINE		30 MIN		POSITIONING	
	MEAN	SD	MEAN	SD	MEAN	SD
GROUP A	82.269	13.987	87.576	13.609	84.423	14.703
GROUP B	86.566	13.187	88.733	14.451	86.9	15.696
P VALUE	0.242		0.909		0.547	

Among the patients undergoing spinal anaesthesia in fracture femur

surgery, there was no statistically significant difference in Heart rate (HR) between the groups. Group A at baseline (mean=82.269, SD=13.987), after 30 minutes (mean=87.576, SD=13.609), during positioning (mean=84.423, SD=14.703) and Group B at baseline (mean=86.566, SD=13.187), after 30 minutes (mean=88.733, SD=14.451), during positioning (mean=86.9, SD=15.696) with a p value of >0.05 as per unpaired t test. Therefore we fail to reject the null hypothesis that there is no difference in the Heart rate (HR) between the intervention groups.

Table 2: BLOOD PRESSURE (MEAN ARTERIAL PRESSURE)

	BASE LINE		30 MIN		POSITIONING	
	MEAN	SD	MEAN	SD	MEAN	SD
GROUP A	101.385	14.851	93.807	13.396	92.615	14.876
GROUP B	93.808	13.396	88.733	14.451	92.666	14.451
P VALUE	0.1238		0.9091		0.9968	

Among the patients undergoing spinal anaesthesia in fracture femur surgery, there was no statistically significant difference in Blood pressure, Mean arterial pressure (MAP) between the groups. Group A at baseline (mean=101.385, SD=14.851), after 30 minutes (mean=93.807, SD=13.396), during positioning (mean=92.615, SD=14.876) and Group B at baseline (mean=93.808, SD=13.396), after 30 minutes (mean=88.733, SD=14.451), during positioning (mean=92.666, SD=14.451) with a p value of >0.05 as per unpaired t test. Therefore we fail to reject the null hypothesis that there is no difference in the Blood pressure, Mean arterial pressure (MAP) between the two groups.

Table 3: O2 SATURATION (SpO2)

TIME	GROUP A		GROUP B		PVALUE
	MEAN (SpO2)	SD	MEAN (SpO2)	SD	
BL	97.385	1.619	98.033	1.2452	0.0967
30 MIN	97.8461	1.2551	97.767	1.4308	0.8261
Positioning	97.8076	1.1668	97.8	1.78274	0.9502

Among the patients undergoing spinal anaesthesia in fracture femur surgery, there was no statistically significant difference in Oxygen saturation (SpO2) between the groups. Group A at baseline (mean=97.385, SD=1.619), after 30 minutes (mean=97.846, SD=1.2551), during positioning (mean=97.8076, SD=1.1668) and Group B at baseline (mean=98.033, SD=1.2452), after 30 minutes (mean=97.767, SD=1.4308), during positioning (mean=97.8, SD=1.7827) with a p value of >0.05 as per unpaired t test. Therefore we fail to reject the null hypothesis that there is no difference in the Oxygen saturation (SpO2) between the intervention groups.

DISCUSSION:

Spinal anaesthesia is the most commonly used anaesthetic technique of choice in orthopaedics for lower limb fractures. While regional anaesthesia has been shown to be more beneficial compared to general anaesthesia, patient positioning for neuraxial blockade may cause severe pain in patients with femur fractures. Various systemic analgesics are being used to provide pain relief during positioning in these patients. Among the systemic analgesics, opioids are widely used but they are known to be associated with side effects like cognitive impairment, vomiting, urinary retention, respiratory depression especially in the elderly. Nerve blocks like the 3 in 1 block, femoral nerve block, fascia iliaca compartment block have all come up as an alternative approach to provide pain relief and improve positioning in these patients.

Fascia iliaca compartment block, first described by Dalens et al is a simple, and safe technique that can be used during pre hospital care, emergency department and in the pre operative setting. It blocks the femoral, lateral femoral cutaneous nerve and sometimes the obturator nerve. Also, since the injection is done away from the artery and nerve, there are minimal chances of neurovascular injury. The usage of ultrasound guidance to visualize the fascia iliaca and to deposit the drug beneath it lateral to the femoral nerve increases the success rate of block and further reduces the risk of neurovascular injury⁸.

The recent introduction of paracetamol i.v overcomes the issue of bioavailability compared with oral and rectal routes thereby earlier onset and ease of administration. It demonstrates efficacy comparable with standard equivalent doses of many NSAIDs with fewer side effects. Its therefore virtually used in every anaesthetic management /

perioperative pain/multimodal analgesia.

Ropivacaine is a long acting local anaesthetic structurally related to bupivacaine (S-enantiomer) serves the purpose of reducing potential toxicity and improving relative sensory and motor block.

CONCLUSION:

Among the patients undergoing spinal anaesthesia in fracture femur surgery, there was no statistically significant difference in Blood pressure, Mean arterial pressure (MAP) between the groups.

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