

Research Article

On Arrival Blocks: Resuscitation of an Obese Patient Following Vehicular Accident in a Resource Poor Setting

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Abstract

Road traffic accidents has been reported to be on the increase, leaving patients with diverse orthopaedic injuries as well as traumatic brain injury. The accidents and emergencies unit continues to struggle during resuscitation and offer inadequate analgesia to these patients who also may be in shock or not fully resuscitated, owing to fear of worsening the haemodynamics, or the respiratory suppression from opioids, most trauma physicians refrain from using strong opioids. Intravenous access in the polytraumatized patients is usually challenging, even more so in obese patients, putting them to greater morbidity or mortality according to some published articles. This case report expresses the importance of prompt management, multi-disciplinary care of an obese polytraumatized patient, which led to shorter hospital stay and reduction in morbidity and mortality. A multi-disciplinary approach with quick involvement of the Anaesthetists made a big difference in establishing venous access promptly to commence resuscitation, preventing onset of morbidity such as acute kidney injury due to hypovolaemia. On arrival blocks, a technique developed by anesthesiologist Ravindra and plastic and hand surgeon Raja is a situation where the skilled Anaesthetist blocks different regions in order to offer patient excellent analgesia without compromising the haemodynamic or respiratory drive is important to note and emphasize.

Keywords

Polytraumatized Patients, On Arrival Blocks, Supraclavicular Block, Obesity, Internal Jugular Vein

1. Introduction

There has been an increase in road accidents in Nigeria for six consecutive years, according to the statistics generated by the Federal Road Safety Corps (FRSC) [1]. It has been shown however, that pain management and the resuscitation of patients in the Accident and Emergencies (AnE) is often challenging and suboptimal. [2, 3] Physicians in the AnE struggle to give analgesics especially the strong opioids for the fear of the side effect profile ranging from respiratory depression and alterations of the haemodynamics of these patients who owing to the trauma would have a depleted hemodynamics probably

from exhaustion of catecholamine reserve or respiratory failure. [3] The setting up of intravenous access for resuscitation becomes challenging or in some instance, often not adequate, at best these patients are canulated with a 20 G (pink) canular with fluid often at maintenance rate which does not cater to the deficit caused by the trauma nor probably on going loss. [4]

Obesity, poses a major public health challenge all over the world [5] and it has been reported that obesity as an independent factor, is detrimental in polytraumatized patients, [6]

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and are also at risk of early hypovolemic shock following trauma. [7] Obesity, as defined by the World Health Organization, is body mass index greater than 30kg/m^2 , which is the ratio of the body mass to the square root of the height. [8] Obesity can be classified into four classes, this can be the obese, severe obese, morbidly obese, or super obese, this is depicted in the table below.

Table 1. WHO classification of weight status.

Classification	B.M.I (Kg/m ²)	Class
Underweight	< 18.50	
Normal	18.50-24.99	
Overweight	≥25	
Class I obesity	≥30	Obese
Class II obesity	35-39.9	Severe obesity
Class III obesity	40-49.9	Morbid obesity
	≥50	Super obesity

On Arrival Block, is a term coined wherein a regional block is administered by a competent regional anesthetist, to a patient who has sustained a major injury upon arrival at the hospital, as the first step of the management protocol, usually in the main operating room instead of in the emergency department. [9] The critical triaging and assessment, fluid resuscitation, as well as pain management of the patient may help mitigate some of the challenges of prolonged hospital stay, cost and other morbidity arising from the aforementioned, and it is key in these polytraumatized patients.

Management of pain is a fundamental human right, and multimodal pain management is being advocated for, and it may include regional techniques as well as use of strong opioids. These regional blocks reduce the side effect profile of dosing of strong opioids or may not be needed in most instances after the blocks, thus advocates for the use of on arrival blocks for the polytraumatized owing to the optimal analgesia without the numerous side effects of opioid use. [10]

Haemodynamics are often not altered with patients being very calm after the procedure and usually able to give better clinical details that is useful in their treatments. [11] Stress response and pain, following trauma, activates the neuroendocrine and immune systems producing systemic inflammatory response increasing oxygen consumption and catabolic state which may predispose to myocardial infarction. [12] Chronic pain had also been reported to arise from poorly treated acute traumatic pain. [13, 14] The system of on arrival regional nerve blocks was introduced in the early 1990s in the Plastic, Hand and Microsurgery Department of Ganga Hospital, Coimbatore, India, by anesthesiologist Ravindra Bhat,

and plastic and hand surgeon Raja Sabapathy. [9]. This was initially limited to brachial plexus block at their very busy centre, where patients were not properly assessed by qualified personnel upon arrival and were usually brought into the ante room of the theatre with the patient groaning in pain, blood stained clothing, with removal of garments resulting in more pain. [9]

2. Case Study

We present the case of a right-handed 34-year-old female, who sustained a right mid shaft humeral fracture with bilateral femoral fracture and pelvic fracture following road traffic accident. Nil history of loss of consciousness nor bleeding from any craniofacial orifice, with examination findings at the Accident and Emergency, she was a young obese looking female in severe painful distress, with left subconjunctival haemorrhage and blood in urine bag. Pulse rate of 110bpm regular small volume, blood pressure of 72/45mmHg, respiratory rate was 24cpm, arterial oxygen saturation in room air 96%.



Figure 1. Right distal femoral fracture.



Figure 2. Iliac wing and pubic ramus fracture.

Assessment of an obese polytraumatized patient in shock with difficult venous access was made. The anesthesia and orthopedic units were quickly notified, upon receiving the consult, the patient was moved into the theatre on a tilttable with leg raise, where an ultrasound guided right internal jugular central line was obtained and resuscitation was commenced with lactated ringers using 2 L and 2 units of packed red cells. assessment of resuscitation was done and post resuscitation vitals had improved as well as urine output now at 0.7 mls/ kg of the assumed body weight of 110 kg.



Figure 3. Right mid shaft humeral fracture.



Figure 4. Left midshaft femoral fracture.

After resuscitation with 2L of lactated ringers and 2 units of blood, the patient was carefully positioned seated with assistance and combined spinal epidural analgesia was sited under aseptic condition. 5mg of heavy bupivacaine with 25mcg of fentanyl was introduced into the intrathecal space as spinal

analgesia with epidural extension using 5ml of 0.25% of plain bupivacaine. Post procedure vitals remained stable after 30 minutes of instituting the block.

A left side supraclavicular block was done also under asepsis using a 50 mm stimulating needle; the block volume was 30ml of 0.25% plain bupivacaine with 2% plain lidocaine, 1mg adrenaline and 4mg dexamethasone using a single shot technique.

Vitals after resuscitation and introduction of blocks were PR 86bpm full volume, BP 120/70mmHg, RR 14cpm and SPO2 98% (intranasal oxygen at 4 l/ min). Patient was sent for appropriate radiological imaging and sent to ICU afterwards for close monitoring. Patient control analgesia was commenced after 2 hours of inserting epidural catheter. The volume controlled continuous analgesia was with 10ml of 0.5% plain bupivacaine with 10mg of morphine made up to 200ml with a flow rate at 2ml per hour. Thromboembolic prophylaxis was by both pharmacological and non-pharmacological, Cleaxane 40mg (intravenous) stat then continue with 40mg subcutaneous daily was commenced 6 hours after the epidural as well as the use of pneumatic, cell-based mattress.

Patient surgery was stratified, with the bilateral femoral fractured fixed the following day, using the same epidural initially inserted. The humeral fracture was fixed on the third day under general anaesthesia, while the pelvic fracture was fixed after a week. The patient spent 10 days in the Intensive Care Unit (ICU) and was subsequently discharged to the surgical/orthopaedic ward, where she spent 3 weeks before her discharge home.

3. Discussion

To obtain good outcome after major trauma; rapid, effective pain relief, early and adequate resuscitation are key clinical factors, and this was demonstrated in the management of this index patient.

On arrival regional blocks comes with a plethora of advantages which includes;

1. Prompt relief of pain; this is a humane thing which on arrival blocks offers.
2. Removes the use of opioids and its attendants side effects such as drowsiness which may affect history taking or clinical assessment.
3. Allows the use of tourniquet in case the need of one arises.
4. Patient may be wheeled around the hospital for radiological investigations conveniently.
5. The blocks may also be used for definitive surgery in some cases.
6. Long term reduction of cost of providing adequate pain relief to the hospital, apart from improving the profile as well as confidence of the patients to the hospital.

A major disadvantage of this procedure is the likely hood of unrecognized compartmental syndrome. [15] This must be actively looked out for so as to institute prompt management.

The use of ultra sound or combination with nerve stimulators has significantly increased the safety profile of these

blocks. It has also made training easier and more attractive when residents can appreciate the wonders of blocks.

4. Conclusion

Polytraumatized patients often require complex management at presentation, during resuscitation adequate analgesia must also be put into consideration, which the use of local anaesthetic agents for both neuro axial or peripheral nerve blocks provides prompt and lasting relief without the need for opioids and numerous company issues. Prompt multi-disciplinary management greatly improves the chances of survival and reduces duration of hospital stay.

Abbreviations

AnE	Accident and Emergencies
BP	Blood Pressure
cpm	Cycle Per Minute
FRSC	Federal Road Safety Corps
ICU	Intensive Care Unit
Kg	Kilogram
Kg/m ²	Kilogram/Metre Square
L	Litre
mg	Milligram
mm	Millimetre
ml	Millilitre
ml/kg	Millilitre Per Kilogram
mmHg	Millimetre of Mercury
%	Percentage
PR	Pulse Rate
RR	Respiratory Rate
SPO2	Oxygen Saturation

Conflicts of Interest

The authors declare no conflicts of interest.

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