Nurse administered fascia iliaca compartment block for pre-operative pain relief in adult fractured neck of femur

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Received 11 July 2007; received in revised form 9 May 2008; accepted 12 May 2008
Available online 3 August 2008

KEYWORDS
Fractured neck of femur; Fascia iliaca compartment block

Summary
Aim: To assess the efficacy of fascia iliaca compartment block (FICB) administered by pain specialist nurses to relieve pain after fractured neck of femur in adults.
Method: Approval was obtained to train two pain nurses on how to perform FICB. Exclusion criteria were set out and adhered to. 30 ml of 0.25% plain bupivacaine was given to establish the block. Pain score using the visual analogue scales was documented pre-block and then at 15 min, 2 h, 8 h and 24 h after the block.
Results: Eleven male and 24 female patients aged 62—102 years had the block. The pain score at presentation for all the patients was 8—10. Fifty-four, 72.7, 77.4 and 80% of the patients had a pain score of 4 or less at 15 min, 2 h, 8 h and 24 h, respectively, after the block. The frequency for the additional analgesics varied between 0 and 2 times in 24 h post-block. There were no reported complications as a result of the procedure.
Conclusion: FICB provided pain relief after fractured neck of femur in more than 70% of patients and can be successfully performed by other trained health care providers without anaesthetic background.

1. Background
Fractured neck of femur is a common, serious and costly injury. Classically, it is a fracture of old age affecting more women than men in their 8th or 9th decade of life [1]. Approximately 70,000 patients suffer from a fractured neck of femur each year in the UK. There is a prediction that these will double as life expectancy increases and with the rising incidence of osteoporosis. The cost to the UK National Health Service is approximately one billion pound sterling per year [2]. There is usually a history of trauma but, in severely weakened patients, it can occur from minor trauma.
bone, direct injury may be trivial or absent. A displaced, unstable hip fracture can cause considerable pain when untreated or under treated. Mortality after hip fracture is high, at 5—10% after a month and a further 10% after 1 year. More than 10% of survivors will be unable to return to living in their homes [3]. The Luton & Dunstable Hospital NHS Foundation Trust is a busy UK District General Hospital treating significant numbers of older patients with fractured neck of femur. A treatment guideline for hip fracture was formulated by the Acute Pain Team in 2005 and approved by the Hospital Guideline Committee (Fig. 1). The novel inclusion in the guideline is that fascia iliaca compartment block is to be administered once the fracture is confirmed radiologically. Fascia iliaca compartment block is a nerve block administered mainly by anaesthetists, although doctors in other specialties have carried out the block successfully [4,5]. The few anaesthetists available in our hospital after normal working hours and the diverse areas to be covered by them made it impossible for them to be available to deliver this service at the point of need. The delay meant undue distress for the patient. In addition there is the need to resort to other forms of pain relief comprising of mainly oral and parenteral opioids which is fraught with many drawbacks for these elderly and often frail patients. In light of all of the above, the Acute Pain Team pioneered a nurse administered fascia iliaca compartment block for fractured neck of femur in order to make this service readily available to more patients.

Two pain specialist nurses (LG and AR) were the first to be trained by anaesthetists (AO and IS). The training involved revision of relevant anatomy and physiology, as well as pharmacology of local anaesthetic agents. They also received training in obtaining consent, ensuring that the patients met the inclusion criteria, recognizing possible complications and their management. The pain specialist nurses were closely supervised until assessed to be competent and confident to carry out the block unsupervised.

Presented below is an audit of patients who received nurse administered fascia iliaca compartment block for pain relief following fractured neck of femur in a 6-month period in 2006 in Luton & Dunstable Hospital NHS Foundation Trust, UK.

2. Aim of audit

This was to assess the efficacy of the fascia iliaca compartment block in the pre-operative relief of fractured neck of femur pain in adults, administered by pain specialist nurses.

3. Methodology

Patients in the audit were referred by Accident & Emergency doctors, the Trauma Sister or the Orthopaedic ward staff. All had radiologically confirmed hip fractures. Exclusion criteria were patient refusal, unconsciousness, dementia, anticoagulation, peripheral neuropathy, known sensitivity to local anaesthetics and body mass index greater than 40. Verbal consent was obtained from the patient preceded by an explanation of the procedure. The pain score was assessed and recorded using a visual analogue scale (0—10). The name and dose of analgesic drug given before the block was also recorded. Under aseptic condition, fascia
iliaca compartment block using the standard technique (described below) was then administered. Thirty millilitres of 0.25% plain bupivacaine were injected not exceeding the maximum safe dose of bupivacaine of 2 mg/kg body weight. Aspiration was repeated after every 5 ml until the desired volume was injected. The pain score was assessed at 15 min, 2 h, 8 h and 24 h after the block using a visual analogue scale. Oral analgesics were prescribed and were to be given on demand by the patient. Supplemental oxygen, recording of vital signs and pain score were to be done as per the treatment algorithm (Fig. 1).

4. Results

Thirty-five blocks were administered in 24 female and 11 male patients aged between 62 and 103 years; the mean age was 82.5 years. Pain score at presentation for all the patients was 8–10. Analgesic requirement for all the patients before and after fascia iliaca compartment block was as in Table 1. Fifteen out of the 35 patients or 42.8% had surgery within 24 h of admission. Following the block, 54% of the patients had a pain score of 4 or less at 15 min. At 2 and 8 h after the block, 72.7 and 77.4% of the patients, respectively, had pain score of 4 or less. Eighty percent of the patients that did not have their surgery within 24 h had pain score of 4 or less (see Fig. 2). Subjectively, ward staff reported that those patients that had the block were easier to nurse in terms of moving and positioning them compared to those patients who were not blocked. There were no reported complications as a result of the procedure.

5. Discussion

The nerves targeted in the fascia iliaca compartment block are the lateral cutaneous, femoral and obturator nerves. The lateral cutaneous nerve of the thigh arises from the dorsal branches of the second and third lumbar rami. It passes under the inguinal ligament to supply the skin on the lateral side of the thigh. The femoral nerve is derived from the dorsal branches of the second, third, and fourth lumbar rami. It descends initially within the substance of the psoas muscle, emerges from its lower lateral border, and descends to enter the thigh deep into the inguinal ligament, in the groove between the psoas and the iliacus muscles, immediately lateral to the femoral artery. The fascia iliaca separates the nerve from the femoral vessels. The femoral nerve innervates the muscles and skin of the anterior thigh, the knee and hip joints. The obturator nerve arises from branches of the second, third, and fourth lumbar ventral rami. It passes down within the pelvis and through the obturator canal into the thigh. It supplies the hip joint, anterior adductor muscles and skin on the medial lower thigh and knee.

Compared to central blockade, lower extremity analgesic blocks are under-utilized, although there are multiple advantages to their use [4]. These

Table 1  Analgesics requirement pre- and post-fascia iliaca compartment block

<table>
<thead>
<tr>
<th>Analgesics</th>
<th>Before block</th>
<th>After block</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of patients</td>
<td>Frequency/24h</td>
</tr>
<tr>
<td>Paracetamol 1 g oral</td>
<td>35</td>
<td>4</td>
</tr>
<tr>
<td>Codeine 30–60 mg oral</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>Tramadol 50 mg oral</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Oromorph 10 mg oral</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Cocodamol 2 tabs oral</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Morphine 2–10 mg i.m./i.v.</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Ibuprofen 200 mg oral</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
include avoidance of bilateral sensory and motor block as well as sympathetic block that could result in haemodynamic instability. Other potential hazards like dural puncture, subarachnoid injection and total spinal of central block are also avoided. A fascia iliaca block rather than the 3 in 1 femoral nerve block is a simple and uncomplicated block that can be done without a nerve locator. A further margin of safety is provided by the fact that needle insertion is in an area lateral to and away from the femoral neurovascular bundle [6]. Thus, health care providers other than anaesthetists can learn to do the block, enabling more patients to benefit [4,5]. Single shot injection as well as continuous fascia iliaca block with a catheter are possible and have been used. Complications of single shot fascia iliaca compartment block are very rare. Side effects recorded with continuous technique but not necessary related to fascia iliaca compartment block include nausea, vomiting, urinary retention, muscle weakness and paraesthesiae of the thigh [8].

The efficacy of fascia iliaca compartment block in the relief of pain has been demonstrated in both children and adults. It has been used for pre-operative and post-operative analgesia especially in procedure involving the lower extremities [4,7]. Pain relief is achieved in about 70% of situations. Following fascia iliaca compartment block, opioid requirements in the elderly are significantly reduced. The incidence of confusion following opioid use, chest infection and pressure area problems due to pain and immobility, are minimized. It is an appealing technique because no complicated equipment is required, complications are uncommon and the procedure can easily be taught to health care professionals without an anaesthetic background.

6. Conclusion

This audit demonstrates that fascia iliaca compartment block can provide pain relief after fractured neck of femur in more than 70% of patients before surgery. It also shows that non-anaesthetic personnel can be trained to do the block successfully. Although no complications were recorded in the series, it must be emphasized that the number of patients in the audit was small.

References


