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Neurovascular assessment post femoral nerve block: Nursing (RN) implications on fall prevention

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Summary Early mobilisation of orthopaedic patients undergoing elective surgery is driven by increasing pressure for early discharge. To facilitate this, the use of femoral nerve blocks (FNB) in joint replacement surgery i.e. arthroplasty has become increasingly popular as an effective analgesic modality. This is directly linked to a reduction in drug related side effects experienced by the patient, but femoral nerve blocks are not without patient related risks and complications. Residual nerve blocks not effectively assessed by nurses using a valid and reliable neurovascular assessment tool can result in a patient falling or having a 'near miss'. This paper as a result aims to re-examine the role of the practising orthopaedic nurse in using a neurovascular assessment tool for FNB and review the related problems experienced within one paradigm of clinical practice. The paper then concludes by recognising potential interventions that may aid and ensure patient safety.

Editor's comments
As expectations are high with regards to early mobilisation of joint replacement patients the assessment skills of the nurse are paramount. This paper explores a number of issues related to early mobilisation and uses recent literature to inform their findings. Neurovascular observations are critical in any limb surgery and a key indicator when the circulation is compromised. Clear assessment strategies along with a working knowledge of potential risks are seen as a crucial skill for the orthopaedic nurse working with joint replacement patients.

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Introduction

This paper aims to focus upon knee replacements with regards to early mobilisation and discharge. Early mobility/discharge can be problematic due to the residual effect of femoral nerve blocks which can delay mobilisation, particularly post total knee replacements. Occasionally this dilemma can prove to be challenging when the block has not been identified in the neurovascular assessment. Ultimately this may result in the patient falling or a 'near miss'.

Literature search details

This article therefore reviews literature to assess whether this predicament is unique or universal and if changes ought to be implemented. The literature was obtained from CINAHL, Medline — Ovid databases and Google Scholar, restricted to 1995—2012. The broad key terms searched were: neurovascular assessment, compartment syndrome and femoral nerve blocks. The search generated many articles but few that directly related to elective orthopaedic nursing. Other journal articles were hand sourced locally from orthopaedic colleagues. The authors excluded any articles that were not specifically related to orthopaedic surgery. See Table 1 for details. As shown in Table 1, CINAHL and Medline — Ovid had the most suitable articles.

Neurovascular assessment

Neurovascular observations provide essential information in the detection of nerve damage and/or compartment syndrome (Irwin, 2009). Popliteal vascular injury and compartment syndrome of the leg are rare but serious complications of knee replacements (Kort et al., 2007). Best (2005) states that other neurovascular complication risks include femoral, peroneal, or sciatic nerve injuries and femoral, iliac, and obturator artery injuries. Altizer (2002) concedes that having knowledge of neurovascular function equips the orthopaedic nurse with accurate assessment skills and awareness of the need for immediate action. Many of the reviewed papers affirm that neurovascular assessment is considered to be the foundation of orthopaedic nursing (Kunkler, 1999; Santy, 2001; Drozd et al., 2007; Murphy et al., 2009; Shields and Clarke, 2011). Early identification of compartment syndrome is emphasised in the literature because if left untreated it may result in loss of limb or death, a situation avoidable if sound neurovascular assessment has occurred (Love, 1998; Harvey, 2006; Wright, 2007). However Murphy et al. (2009) recognise that this can be challenging as the signs and symptoms can be both masked and intermingled leading to possible delays in diagnosis. Therefore it is agreed that an effective tool to guide assessment is required (Schoen, 2000; Murphy et al., 2009).

Nursing role

Nursing is in a unique position to perform neurovascular assessments as there ia a high contact time with the patient (Love, 1998; Wright, 2007; Shields and Clarke, 2011). As a result, nurses tend to act as surveillance systems for the early detection of complications and are in the best position to initiate actions that minimise negative outcomes (Aiken et al., 2003; Murphy et al., 2009). The assessment itself involves the evaluation of the nervous and vascular integrity of a limb (Judge, 2007). The nerve assessment includes examining for sensation and movement whilst vascular assessment comprises of checking colour, temperature, capillary refill and palpation of relevant pulses (Miller and Askew, 2007; Murphy et al., 2009). Both limbs should be assessed simultaneously, although Irwin (2009) recommends that only the injured or affected limb is required to be recorded. Interestingly, McCullough and Evans (1985) identified that sensation is probably the most poorly assessed aspect of the neurovascular assessment, but the authors were unable to locate any further information on this topic.

Compartment syndrome

Compartment syndrome is defined as increased tissue pressure within a muscle compartment that is bound by fascia, which can potentially cause ischaemia to the muscle and/or nerve tissue within the compartment (Gonce Morton et al., 2005; Judge, 2007; Wright, 2007; Johnston-Walker and Hardcastle, 2011). The result of an unchecked acute compartment syndrome is catastrophic and can include neurological deficit, muscle necrosis, ischaemic contracture, infection and delayed healing (Elliott and Johnstone, 2003). Johnston-Walker and Hardcastle (2011) identify that there are five signs of acute compartment syndrome are:

- Pain;
- Pallor (or colour);