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Evidence based venous thromboprophylaxis in patients undergoing total hip replacement (THR), total knee replacement (TKR) and hip fracture surgery (HFS)

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Summary Patients undergoing total hip, knee replacement and hip fracture surgery are at high risk of developing venous thromboembolism. Incidence of deep vein thrombosis ranges from 40% to 70% and 1% to 7% for fatal pulmonary embolism. Venous thromboprophylaxis comprises mechanical and pharmacological intervention but for added protection in major orthopaedic surgery, most national and international guidelines advise a combined regimen of both modalities. Reportedly, 40% of such patients do not receive pharmacological prophylaxis because of the increased risk of bleeding. When considering pharmacological prophylaxis, a trade off between the benefits of reducing venous thromboembolism and the potential harms of bleeding and haematoma formation must be balanced. Anti-embolism stockings, intermittent pneumatic pump and foot impulse devices are the main mechanical methods but are often collectively addressed as mechanical prophylaxis as no difference in efficacy exists between these devices. The National Institute for Health and Clinical Excellence advises that one of those devices be commenced preoperatively and continued until the patients have no significant reduced immobility. Anti-embolism stockings (knee or thigh) are to be applied with caution. Mechanical prophylaxis is particularly important in hip/knee and hip fracture surgery, when patients are not protected by pharmacological prophylaxis.

Unfractionated heparin, low molecular weight heparin, pentasaccharide fondaparinux and old and new oral anticoagulants are the mainstay of pharmacological prophylaxis. In the absence of contraindication, it is recommended that pharma-

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cological prophylaxis is timely initiated postoperatively. Extended pharmacological prophylaxis is recommended for 28–35 days for hip replacement and hip fracture surgery and 10–14 days for knee replacement surgery.

Editor's comments

This paper from Ricky Autar looks at key data that should influence the treatment of patients pre- and postoperatively following total hip replacement, total knee replacement and proximal femoral fractures. The challenge is around whether all the information relevant to VTE treatment is being considered to improve patient outcomes and if orthopaedic practitioners could have any influence over those prescribing prophalatic VTE interventions. **BS**

Introduction

Scale of the problem

Venous thromboembolism (VTE) is internationally known as a silent killer (Donaldson, 2006) and can cause serious health problems with major adverse outcomes, ranging from acute deep vein thrombosis (DVT) to fatal pulmonary embolism (PE). In the long term, it is associated with increased recurrence and because of chronic venous insufficiency and venous ulceration, it can cause post thrombotic syndrome (PTS) which is a chronic condition characterised by chronic disabling pain. About 25,000–32,000 people die of VTE annually in England alone (House of Common Health Select Committee, 2005). In major orthopaedic surgery such as total hip, total knee replacement and hip fracture surgery, the prevalence of VTE is markedly increased in those who have co-morbidities such as cardio respiratory conditions and/or diabetes (Turnbull, 2007). VTE occurs in 40–70% of such patients in the absence of venous thromboprophylaxis (Table 1).

Forty percent of orthopaedic patients do not receive pharmacological prophylaxis (Fletcher, 2002; ANZ, 2007; NICE, 2010) and the given reasons for this suboptimal uptake are outlined below:

- Most VTE occurs in the first three months after discharge rather than during their hospital stay (Autar, 2002; White et al. 2003). Discharged patients are often readmitted to hospital with VTE, but under another services such as haematology, outpatient and respiratory. As a result, individual surgeons are led to conclude that this is not a problem in their practices.
- Although there are robust clinical data that prophylactic doses of UFH and LMWH are not associated with significantly increased risk of bleeding, the risk remains overestimated in individual surgeon experience (ACCP, 2004; Vaitkus et al., 2005).
- There appear to be some conflicting recommendations between some guidelines on the choice of venous thromboprophylaxis. The Scottish Intercollegiate Guideline Network (SIGN) (2002) recommends the thromboprophylactic use of aspirin for 35 days from admission. This advice is based on the Pulmonary Embolism Prevention (PEP) (2000) report that aspirin reduces the risk of DVT and PE by at least a third. Counter claiming the SIGN's advice, the International Angiology Union (IUA) Statement (2006) states that the risk reduction with aspirin was only half of that expected from LMWH and one third for fondaparinux. The American College of Chest Physicians (ACCP) (2004, 2008) guidelines also dismissed aspirin as it is validated to have weaker thromboprophylaxis effect and inferior to UFH, LMWH and pentasacchiride. A similar position is held by the National Institute for Health and Clinical Excellence (NICE) guidance on VTE. NICE is a

Table 1 VTE incidence in the absence of venous thromboprophylaxis.

Study	Surgery	DVT%	PE%
Freedman et al. (2001) Warwick et al. (2002)	Total hip replacement	40–70	2–4
White et al. (1998) Douketis et al. (2002)	Total knee replacement	41–85	1
Bergqvist et al. (1997) Dahl et al., 2000 Eriksson and Lassen (2003)	Hip fracture surgery	50–70	5–7