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Thromboprophylaxis in Spinal Surgery – Current UK Practice

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Abstract

Purpose: Venous thrombotic events remain a common problem following both spinal cord injury and elective spinal surgery. Recent guidance has been issued by the National Institute of Clinical Excellence (NICE) on the use of prophylaxis for these patients. This study was designed to show how spinal units in the United Kingdom (UK) are managing this risk for their patients.

Method: We conducted a telephonic survey of 30 spinal units which were identified from a NHS website. We asked about their current method of thromboprophylaxis in spinal patients and asked if they had changed their practice based on the recommendations by NICE

Results: 13.3% of the centres had changed their practice based on these updated clinical guidelines. 93% centres used mechanoprophylaxis only in the elective setting and 10% of centres reported increased wound complications with their new practice.

Conclusion: Our results show that the majority of spinal centres are compliant with the recommendations of NICE. However, there remains a lack of good quality clinical evidence for thromboprophylaxis and more research should be conducted in this area.

Keywords: Deep vein thrombosis; Thromboprophylaxis; Spinal surgery; Spinal cord injury

Introduction

Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE), collectively known as Venous Thrombo-Embolisms (VTE), remain a common problem following orthopaedic surgery. Many studies have assessed its prevalence in patients undergoing elective joint arthroplasty. There is a lack of clear information on the rate and prevalence of VTE following Spinal Cord Injury (SCI) or elective spinal procedures. The incidence of DVT following SCI has been reported to range from 9-100% depending on the diagnostic method used [1]. VTE account for 9.7% of deaths in the first year following SCI, and are thus seen as a preventable cause of morbidity and mortality [2]. There is limited data available on the rate of VTE in patients undergoing elective spinal surgery. Clinically symptomatic rates of 3.7% for DVT and 2.2% for PE have been reported [3], whilst venography-detected DVTs may be as high as 18% [4].

Numerous factors have been identified as possible causes for the high incidence of VTE following spinal injury or surgery. In addition to Virchow's triad [5], other factors include advanced age, anterior approach, surgery for malignancy, length of procedure and cervical versus lumbar surgery [6]. In general those patients undergoing elective spinal surgery are thought to be at lower risk than the general orthopaedic population for risk of VTE.

The North American Spinal Society (NASS) issued their own guidelines following a systematic review of all evidence for thromboprophylaxis in 2008 [7]. The National Institute of Clinical Excellence (NICE) based their guidelines on the same evidence [8]. Within the surgical sections of the guidelines, there is a specific section for cranial and spinal surgery. These guidelines recommend that all patients undergoing elective spinal surgery should commence mechanical prophylaxis upon admission and then consider chemoprohylaxis if they are deemed to be of low risk for bleeding. This should be continued until they are mobile. A study looking at the risk of VTE in SCI found that those patients who were older, obese, presenting with flaccid paralysis or cancer should have a more aggressive regimen for prevention of VTE [9].

Both sets of guidelines allow surgeons significant flexibility with regards to VTE prophylaxis in spinal surgery and thus, VTE prophylaxis protocols in UK spinal centres will vary. The role of pharmacological prophylaxis remains less well defined. The aim of this study is to provide a snapshot of current practice in UK spinal centres and to see whether NICE guidance is being followed.

Method

We conducted a telephonic interview of the spinal centres in the UK to see what impact the NICE guidance had on the practice of spinal surgeons in the UK. We wanted to assess current thromboprophylaxis regimes amongst UK spinal centres, to gauge compliance with the NICE guidance and whether any centres have changed their practice to accommodate these recommendations.

The spinal centres were identified using a NHS website. Centres which were included had two or more consultant spinal surgeons. We contacted the spinal SpR, spinal nurse specialists or consultants which were available via the hospitals switchboard. They were contacted by one of the authors and a telephonic questionnaire was conducted. Both orthopaedic and neurosurgical spinal units were included in the study.

Questions were asked about whether they had a departmental thromboprophylaxis policy? Had this policy been changed since the introduction of the NICE guidelines? What were their present regimens and whether they had seen an increase in wound complications since the new guidelines?

Information in terms of the complications were taken from the departments own morbidity and mortality figures at a later date.

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Results

We contacted 30 spinal centres in the UK, 3 of which were purely Neurosurgical centres. All centres routinely used Graduated Compressive Stockings (GCS) or Thromboembolic Stockings (TEDS) for both elective and trauma patients unless contraindicated. Most centres (26/30-87%) discontinued the use of GCS/TEDS once the patients were deemed sufficiently mobile. Four out of thirty (13%) kept patients in stockings for 6 weeks after major spinal procedures. Seven centres (23%) regularly used foot pumps post operatively (Figure 1).

There was variable use of chemoprophylaxis between the centres. No centre routinely used chemoprophylaxis and decisions were based on patient risk factors. 28/30 centres (93%) used only mechanoprophylaxis for elective patients (when not deemed high risk). Two thirds of centres routinely use a combination of mechano and chemoprophylaxis for trauma patients. When chemoprophylaxis was used, Low molecular weight heparin (LMWH) was the agent of choice. This was stopped once the patient was mobile. No centres used aspirin, warfarin or any other agents as their first choice chemoprophylaxis (Figure 2,3). All centres used chemoprophylaxis in patients with spinal cord injury and paralysis upon admission.

3 centres (10%) reported that they had noticed an increase in wound complications with the use of chemoprophylaxis.

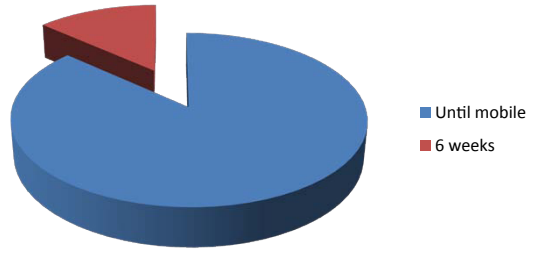

Figure 1: Length of time TEDS worn.

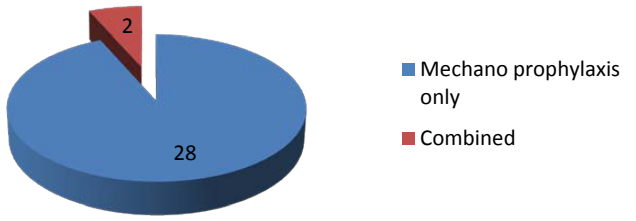

Figure 2: Elective Spinal Patients.

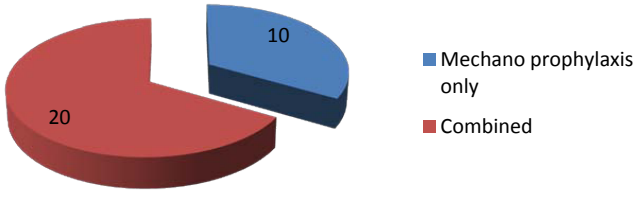

Figure 3: Trauma Spinal Patients.

Discussion

Our study provides a snapshot of current VTE thromboprophylaxis amongst UK spinal centres. Most centres have a protocol which adheres to the NICE guidelines. We identified 4 centres that had specifically changed their practice since the introduction of the NICE guidance.

A retrospective study performed in Vienna found that the overall significant rate of thromboprophylaxis in 978 spinal trauma patients was 2.2% [10]. In this retrospective study the authors found that the surgical approach, surgical site and the presence of motor deficit all were positive indicators for high risk of thrombotic events following surgery. Previous studies have also identified risk factors such as lumbar surgery, anterior approach surgery and the presence of motor deficit as positive factors for predicting high risk for DVT. Other risk factors such as smoking, age and the male sex have been identified as a risk factor for thrombotic events following spinal surgery [11]. The scoliosis research society performed a large multi-centre study looking at the overall risks of spinal surgery. They found that the risk rate of thromboprophylaxis depended on the type of surgery and the use of instrumentation. Patients who were undergoing lumbar discectomies had the lowest rate of thromboembolic event at 0.47% rising to a rate of 12.4% for patients undergoing a decompression for metastatic cord compression [12]. Undoubtedly, the rate of DVT detections will vary greatly depending on the method used to detect them. The routine use of Doppler scanning on all patients post operatively increases the rate of detection of all DVTS; however, most of these are asymptomatic and probably clinically insignificant. Such diagnostic techniques have not been found to be cost effective [13].

The centres reporting an increase in the amount of wound complications seen with changes to current chemoprophylaxis are not alone. Studies have looked at the increase of wound complications following the use of chemoprophylaxis. This could be as a result of the hypocoagubility of the blood compared to that without thromboprophylaxis. The literature provides arguments for both sides in this debate. Cain et al. performed a study looking at the safety of the use of heparin in patients who had undergone thoracolumbar and lumbar fusion [14]. They found that heparin had increased rates of post-operative complications such as wound haematomas. This was in contrast to the large retrospective study performed by Gerlasch et al., who found that post-operative administration within the first 24 hours did not cause and increase in spinal haematoma rates [15].

A systematic review by Glotzbecker et al. [16] reviewed 493 abstracts and found that the overall risk of developing an epidural haematoma following surgery was relative low ranging from 0-1%. Interestingly the rate of epidural haematoma in series using chemical prophylaxis was lower than that were no prophylaxis was used. They somewhat controversially concluded that the quality of the data remains inconclusive to assess the safety of chemoprophylaxis for this. A meta-analysis of 14 papers on VTE in elective spinal surgery by Sansone et al., found a rate of 8 epidural haematomas out of 2071 patients (0.004%) [17].

With the rate of VTE being variable in the numerous studies that are in the medical literature for elective spinal surgery, there seems little place for the use of prophylactic inferior vena cava filters as suggested by one study [18]. Although another more recent study looking at the rate of PE following prophylactic insertion of IVC filter found that it caused a reduction in the rate of PE in the high risk group [19]. The diverse nature of spinal surgery and the patients it is performed on make guidelines difficult to draft. It is widely accepted that single level procedures such as discectomy carry low risk of VTE whilst the risk is

greater for more complex spinal deformity or anterior and posterior arthrodesis cases [20].

A further systematic review of the risk of anticoagulation in spinal surgery revealed that those patients undergoing surgery for trauma should receive chemoprophylaxis [21]. This is because of a significantly higher rate of VTE in these patients compared to those that were undergoing elective surgery. They also found that the risk of bleeding was a rare complication with the use of anticoagulation with a rate of 0.0-4.3% depending on the anticoagulant used. A retrospective cohort analysis by Cunningham et al found that the use of pre-operative VTE chemoprophylaxis did not have an effect on either the VTE rate or the rate of epidural haematoma suggesting that it might be safe to consider pre-operative prophylaxis in high risk patients or procedures [22].

A study from Philapdelphia performed in 2010 found that of the 47 institutes contacted, protocols for the use of thromboprophylaxis in spinal patients existed in 89% of institutes [23]. The majority of these centres only had a protocol for trauma patients and those with SCI and not elective surgery patients. They found that 22 of the responding 47 institutes had surgeons who had treated patients for complication following the use of LMWH. This is in contrast from the main body of literature.

Conclusion

There is a lack of evidence in the incidence of VTE in spinal surgery. The NICE guidelines provide a generic framework for surgeons to work within, and most centres appear to be following NICE guidelines with four (13.3%) having changed their thromboprophylaxis protocols since the introduction of NICE guidelines.

There is variation in practice, mainly with regard to the timing of prophylaxis.

This survey shows that the majority of centres adhere to routine use of mechano-prophylaxis for all patients without SCI. LMWH is chemotherapeutic agent of choice and that combined mechano and chemoprophylaxis is used in SCI patients. Further large scale multicentred studies into the overall risk of VTE are required.

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