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The importance of deep vein thrombosis prophylaxis in hospitalised medical patients

Venous thromboembolism (VTE) is an easily preventable disease with a substantial risk of morbidity and mortality in patients hospitalised for acute medical and surgical procedures[1]. Acutely, pulmonary embolism (PE) can be fatal and in the long term pulmonary hypertension can develop from recurrent PE[2]. Chronic venous insufficiency can also occur in many patients following deep vein thrombosis (DVT) resulting in skin changes and leg ulceration that have significant impact upon both health care costs and patient quality of life[2].

What is the magnitude of the problem?

Globally, a large proportion of hospitalised patients are at risk of VTE; almost all in-patients have at least one risk factor for VTE and it has been cited that around 40% have three or more risk factors[3]. The impact of VTE within the surgical specialities has been recognised for more than 20 years, however prevalence in medical patients has only recently been investigated in large clinical trials[4]. The incidence of VTE in at-risk acute medical patients **not** given prophylaxis varies dependent upon medical condition. Spyropoulos (2005) cites rates of 10-26% for general medical patients, 17-34% for myocardial infarction, 11-75% for stroke, 20-40% for congestive heart failure and 25-42% for those in medical ICU.

Despite there being strong evidence to support routine thromboprophylaxis in most hospitalised patient groups[3], it still remains underused[3]. This is illustrated in a recently published multi-national cross sectional survey[1] where chart audit of VTE prophylaxis occurred for more than 68,000 patients in 358 hospitals across 32 countries. Of this cohort 55% were categorised as medical patients and the study identified that only 39.5% of at risk patients received an ACCP recommended form of prophylaxis. The use of VTE prophylaxis was particularly poor for those with active malignancy and ischaemic stroke – two of the highest risk groups for VTE.

Why is the hospitalised medical patient at risk of VTE?

The risk of VTE is related to the presence or absence of specific risk factors and the risk is cumulative[5]. There are both patient related characteristics such as age, obesity and restricted mobility as well as disease related characteristics that include conditions such as malignancy, stroke, recent myocardial infarction and congestive heart failure[6]. Spyropoulos[4] highlights that there are a group of approximately 15 well established high-risk factors for acutely ill medical patients including those mentioned above but also past history of VTE, acute inflammatory disease, acute infection, pregnancy and postpartum. Several challenges exist in providing adequate VTE prophylaxis to medical patients. One particular issue is that medical patients tend to be older, suffer from multiple co-morbid conditions and frequently take a cocktail of medications that may interact with VTE prophylactic measures[4].

Prophylaxis

Predisposing factors for VTE generally alter one or more of the components of Virchows triad – abnormal blood constituents, abnormal vessel wall and abnormal flow[7]. Prophylactic treatments aim to improve venous flow and/ or reduce blood coagulability[5].

Seven studies using cohorts of medical patients have compared use of pharmacological prophylaxis with that of placebo or no prophylaxis and the results demonstrated good efficacy in terms of significantly reducing VTE events combined with low bleeding risk[3]. However, there are considerable numbers of medical patients who are not able to utilise anticoagulant therapies due to either active gastrointestinal or intracranial bleeding or high bleeding risk[5]. This figure equates to 10% of at risk medical patients and 9% of at risk surgical patients[1]. In such circumstances, guidelines and consensus papers recommend mechanical thromboprophylaxis as the optimal method[2,3].

MECHANICAL AND BIOCHEMICAL EFFECTS OF FLOWTRON® DVT PROPHYLAXIS SYSTEMS:

Prevention of venous stasis:

The *FLOWTRON* DVT Prophylaxis System prevents venous stasis by active augmentation of blood flow[8,9,10]. This reduces stasis, flushes valve pockets where thrombi originate, decreases venous hypertension and decreases interstitial oedema[11].

Increases fibrinolytic activity:

Use of *FLOWTRON* DVT Prophylaxis Systems results in an increase in the fibrinolytic activity of the blood[10] and suppression of procoagulant factors[12].

CLINICAL STUDIES USING THE *FLOWTRON* DVT PROPYLAXIS SYSTEMS:

Extrapolation of data from trials in surgical specialities has led to a Grade 1A recommendation for use of intermittent pneumatic compression or graduated compression hosiery when there is a contraindication to anticoagulant prophylaxis[3].

Kamran[12] undertook a clinical study examining rates of VTE in 681 patients with non-haemorrhagic stroke over an 8 year period. The standard prophylaxis was twice daily heparin and anti-embolic hosiery. The intervention consisted of the *FLOWTRON* DVT Prophylaxis system calf length garments applied to both legs when the patient was non-ambulatory. Results demonstrated a 40 fold reduction in DVT rates for patients using the combination of *FLOWTRON* therapy, antiembolic stockings and heparin compared to when heparin and stockings were used alone.

Comparative studies in surgical specialities[14,15] have demonstrated that the *FLOWTRON* DVT Prophylaxis System is as effective as low molecular weight heparin in preventing DVT and PE. Additionally, there was significantly lower cost and no side effects associated with use of the *FLOWTRON* Systems. A recent comparative evaluation of 8 different types of IPC device from 4 different manufacturers[16] commonly used in the US identified the *FLOWTRON* Universal Prophylaxis system as providing the best unit overall pump with excellent safety and ease of use features.

Conclusion

Medical patients account for a high proportion of patients in hospital and it is important to close the evidence-practice gap in order to reduce the burden of VTE based disease in this patient group[3].

Evidence based guidelines strongly recommend the use of thromboprophylaxis in acutely ill medical patients with congestive heart failure or severe respiratory disease who are confined to bed and have one or more additional risk factors[3]. In those patients for whom anticoagulant prophylaxis is contraindicated or not tolerated, use of *FLOWTRON* DVT prophylaxis provides a safe and effective alternative method of VTE prophylaxis.

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