

Inadequate use of prophylaxis against venous thromboembolism in Danish medical departments

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ABSTRACTS

INTRODUCTION: Venous thromboembolism (VTE) constitutes a major risk factor in hospitalized acutely ill medical patients. It has been demonstrated in numerous papers that by using different forms of prophylaxis, a significant reduction of the incidence of VTE can be achieved. In this article we assessed the tendencies in the use of venous thromboprophylaxis (TP) at internal medicine departments in Denmark. The results were compared with results from a similar study conducted in 2005.

MATERIAL AND METHODS: All medical departments in Denmark received a two-page questionnaire on TP. The recipients were asked to evaluate the frequency, use of local instructions, form of administration, side-effects and duration of TP at their departments. One reminder was sent out.

RESULTS: A total of 188 responses were received (90% response rate), 16 were excluded. Virtually all departments indicated that they used TP (92%). At intensive care units, the TP was used according to local guidelines at 77% of the wards and at the other subspecialties of internal medicine, TP was used in less than 50%. By far the most frequently used prophylaxis method was low molecular weight heparin, which was used by more than 80% of the departments. Side-effects, most often superficial bleeding and haematomas, were reported in 25% of the cases. The following serious side-effects were reported: heparin-induced thrombocytopenia (n = 2), stroke (n = 1) and gastrointestinal bleeding (n = 3). No difference was observed between the hospitals of larger cities and those of smaller cities.

CONCLUSION: In Denmark, no significant increase in the use of TP at internal medicine departments has been observed since 2005. The guideline's strong recommendation of TP is still not reflected in daily practice.

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The clinical value of prophylaxis against venous thromboembolism (VTE) is well-established and has been documented for almost all types of surgery [1]. Venous thromboprophylaxis (TP) is used routinely although it took several years to implement the scientific results into daily practice [2]. In internal medicine, preventing VTE has also been investigated and the evidence for TP is clear with several clinical randomized studies showing a statistically significant effect [3, 4]. Nevertheless, the

scientific results seem not to be reflected in daily practice at internal medicine and neurological departments in contrast to surgical departments where TP is used routinely.

The aim of this work was to evaluate the use of TP at the internal medical departments, intensive care units and neurological departments in Denmark.

MATERIAL AND METHODS

In December 2008, our questionnaires were sent to 208 departments, wards and clinics throughout Denmark. The addresses were found using a list of departments obtained from the internet. One reminder was sent out after two months. The questionnaire contained questions about whether thromboprophylaxis was used at all, and whether it was used routinely according to guidelines or implemented according to individual evaluation, which categories of patients received prophylaxis and what indications prompted its use. We also enquired about the choice of method, dosage and duration of prophylaxis. In addition, departments were asked to provide an estimate of the nature and frequency of side effects of the used prophylaxis. The responses were related to specialty and to the location of the hospital. Metropolitan hospitals were defined as branches located in municipalities of Copenhagen, Odense, Aarhus and Aalborg – all others were defined as rural hospitals.

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ORIGINAL ARTICLE

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The most common sources of lung embolism (arrows) are proximal leg deep vein thrombosis or pelvic vein thrombosis with pathological origin from a continuum termed venous thromboembolism. Unfortunately, the prophylaxis against this life-threatening condition is not used adequately at internal medicine departments.

RESULTS

In total we received 188 responses in the period ending three months after the last reminder was sent out (90% response rate). Six wards had been closed, 14 had not

TABLE 1

Use of venous thromboprophylaxis in general and according to guidelines at internal medicine departments in Denmark in 2008-2009^a.

| Department | Prophylaxis used 2008-2009, n/N (%) | |
|--|-------------------------------------|-----------------|
| | in general | with guidelines |
| Intensive care | 30/31 (96.8) | 24/31 (7.4) |
| Neurology | 16/16 (100) | 7/16 (43.8) |
| Internal medicine (more than one subspecialty specified) | 114/125 (91.2) | 27/125 (2.6) |
| Cardiology | 9/10 (90) | 4/10 (40) |
| Rheumatology | 8/12 (66.7) | 2/12 (16.7) |
| Gastroenterology | 6/7 (85.7) | 1/7 (14.3) |
| Geriatrics | 7/7 (100) | 2/7 (28.6) |
| Infectious disease | 5/5 (100) | 1/5 (20) |
| Endocrinology | 6/8 (75) | 1/8 (12.5) |
| Oncology/haematology | 11/12 (91.7) | 4/12 (33.3) |
| Pulmonology | 5/6 (83.3) | 0/6 |
| Nephrology | 7/7 (100) | 2/7 (28.6) |
| Other | 1/1 (100) | 0/1 |
| Internal medicine without specification | 49/50 (98) | 10/50 (20) |

N = number of departments of a given subspecialty.

n = number of departments of a given subspecialty using thromboprophylaxis.

a) In the case of the intensive care units, the difference between the use of venous thromboprophylaxis in general versus its use according to guidelines is 20%. The discrepancy between general use and use according to guidelines in the case of other internal medicine subspecialties is much higher (ranging 56-100%). The table must be evaluated with caution because of the low number of departments/clinics within some of the subspecialties.

TABLE 2

Indications for use of venous thromboprophylaxis at internal medicine departments in Denmark in 2008-2009. The values are n (%)^a.

| | Prophylaxis used | Not used | Not answered |
|---|------------------|-----------|--------------|
| Ischaemic apoplexy with hemiparesis | 98 (56.9) | 9 (5.2) | 65 (37.8) |
| AMI | 79 (46) | 16 (8.7) | 78 (45.4) |
| Severe heart failure | 100 (58.1) | 20 (11) | 52 (30.2) |
| Severe COPD | 78 (45.3) | 41 (23.8) | 52 (30.2) |
| Severe infectious disease | 85 (49.5) | 39 (22.7) | 48 (27.9) |
| Bed rest for 24h/day | 146 (84.8) | 4 (2.3) | 22 (12.8) |
| Patients with a central vein catheter | 61 (35.4) | 69 (40.1) | 42 (24.4) |
| Chemotherapy for malignant condition | 51 (29.6) | 51 (29.7) | 70 (40.5) |
| Malignant diseases without chemotherapy | 60 (34.9) | 55 (32) | 57 (33.7) |
| Age > 80 years, or other age criteria | 47 (27.4) | 73 (42.4) | 52 (30.2) |
| Other | 26 (15.1) | 5 (2.9) | 141 (82) |

AMI = acute myocardial infarction; COPD = chronic obstructive pulmonary disease.

a) Almost 85% of the departments use venous thromboprophylaxis if patients are immobilised. Severe heart failure, myocardial infarction, ischaemic apoplexy, severe infectious disease and chronic obstructive pulmonary disease result in venous thromboprophylaxis at about 50% of the departments. Only about 35% of the departments apply venous thromboprophylaxis in the cases of malignancy if no chemotherapy is administered (30% if administered). The age criterion was used as an indication for venous thromboprophylaxis in 28% of the cases. 30-40% of the questions regarding indications were not answered.

responded, 16 anaesthesiology departments stated that they could not answer as they serviced a mixture of both surgical and medical patients.

Virtually all departments (90%) indicated that they were using TP (Table 1). At intensive care units, TP was used according to local guidelines at 77% of the wards, while this was only the case in less than half of the remaining departments. In general, it was left to individual assessment (75%) to decide whether a particular patient was at risk of VTE. The application rate varied much among the different types of clinic/section, although the figures should be evaluated with caution due to the low number of departments/clinics within each subspecialty.

There were no differences in TP application rates between departments/clinics located in major cities and the rest. Indications for the use of prophylaxis vary. The most commonly used indication for TP was bed rest, myocardial infarction and stroke (Table 2). By far the most frequently used method was low molecular weight heparin (LMWH), which was employed by more than 80%. Compression stockings were used sporadically (13.4%) and at a few wards, they were used in combination with LMWH. As many as 46 departments reported using warfarin (although this number may include treatment of comorbidities already diagnosed and not only primary prophylactic treatment).

About 25% of the departments indicated that they observed side-effects of TP (18% left this question unanswered). In most cases, the type of side-effects was not specified. Among the answered questionnaires, subcutaneous bleeding was by far the most frequent side-effect. There were no strict guidelines with regard to the duration of prophylaxis with the answer "until complete mobilization" as the most frequently provided answer. The duration of TP varied; mobilisation (40%) of the patient was the most important factor resulting in termination of the treatment and 30% of the departments reported individual evaluation. 13% of the departments did not answer this question.

Finally, the survey results were compared with the almost identical survey results from 2005 [5]. Comparison of the data using the chi squared test method showed that no significant change in TP since 2005 was seen, either in the use of TP or in the use of TP according to the guidelines (Figure 1).

DISCUSSION

The profoundly reduced risk of VTE at surgical departments owing to prophylactic measures is well-documented, and although still discussed [6], prophylaxis remains widely used in these patients. The situation is, however, very different at departments of internal medicine where TP is not used routinely. Gradually, as evidence on the beneficial effects of PT builds, a number of med-

ical conditions have been identified in which TP should be used to reduce a high VTE incidence:

- Congestive heart failure (New York Heart Association Classification, III-IV)
- Severe pneumonia
- Chronic obstructive pulmonary disease
- Inflammatory bowel disease
- Septicemia
- Non-haemorrhagic stroke
- Patients at intensive care units.

Other conditions that carry an increased risk of thrombosis do not automatically trigger prophylaxis. These include bed rest [7], obesity [8], history of deep venous thrombosis (DVT) [9], cancer [10], pregnancy [11] and old age [12]. Moreover, the treatment is often subject to individual assessment. There are probably several reasons why TP is not used routinely in internal medicine.

One argument against the extended use of TP in internal medicine may be that the NNT (number needed to treat) of symptomatic thrombosis episodes is quite high. For example, in PREVENT it has been estimated to be 1,666, 344 and 285 for cases of symptomatic pulmonary embolism, proximal DVT and all DVT cases, respectively [13]. Furthermore, in many studies of prophylaxis in medical departments, the efficacy of treatment has been assessed on the basis of asymptomatic thrombosis episodes found with screening venographies or ultrasound which implies that antithrombotic treatment is clinically irrelevant in these cases and that the absolute risk reduction based on these so-called surrogate par-

ameters is of questionable importance [12]. However, it is known that even asymptomatic venous thrombosis can lead to later venous insufficiency and thus may be worth preventing [14]. The third argument is that the economic advantages described in several papers are calculated on artificial grounds and favour prophylactic measures.

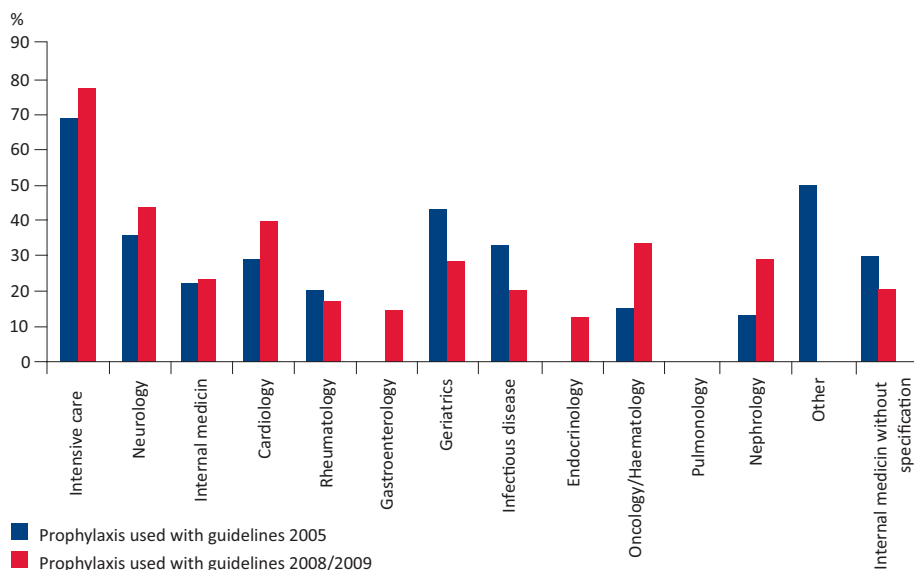
The implementation of TP may be associated with significant practical difficulties. The evaluation of a complicated medical patient can be difficult, especially for junior physicians who usually are responsible for the first contact with the patient. A second argument is that the lack of clear guidelines and algorithms regarding TP do not favour use of prophylaxis. Thirdly, introduction of evaluation as an integral part of standard patient examination would probably call for special strategies such as the use of electronic questionnaires. Also, understanding the benefit of TP as such does not necessarily mean that it will be used in practice. A recently published analysis of TP at both internal medicine and surgical departments showed that only certain strategies encourage the use of TP, especially the combination of computer technology and internal audit [15].

A limitation of the present study is that many questions in the questionnaire were not answered; this may indicate that respondents had problems interpreting the questions. However, to facilitate an evaluation of possible changes in the use of TP, the questionnaire used was similar to the one used in 2005.

Despite this limitation, we believe that the current status of TP at internal medical and neurological departments is less than optimal. We do not postulate that all



FIGURE 1



Comparison of venous thromboprophylaxis use at Danish internal medicine departments according to guidelines in 2005 and 2008-2009. As shown in Table 1 no significant differences between departments were observed. In the course of the last five years, the structure of the Danish health-care system has been changed. Many of the departments dating back to 2005 no longer exist, however the health-care reform did not affect the percentage of the departments where venous thromboprophylaxis is used according to guidelines.

non-surgical patients should be treated with TP, but an individual risk assessment is needed to identify TP candidates. In addition, studies indicate that LWHM and UFH (unfractionated heparin) are cost-effective [16]. The promising development of new oral anticoagulants may facilitate the implementation of TP in the future [17, 18].

This article should not be considered a formal auditing of the Danish internal medicine departments; our main objective was to evaluate any potential change in the use of TP at internal medicine departments since 2005.

However, on the basis of the data presented, it can be concluded that no significant increase was observed in the use of TP in medical and neurological departments in Denmark compared with the survey published in 2005. It may be postulated that auditing with direct feedback to departments and possibly other methods of control would promote the use of TP.

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