



Received: 21 July 2016
Accepted: 24 September 2016
First Published: 30 September 2016

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Reviewing editor:
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RESPIRATORY MEDICINE | RESEARCH ARTICLE

Are we preventing VTE in patients with an infective exacerbation of chronic obstructive pulmonary disease - low adherence to VTE prophylaxis guidelines

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Abstract: Venous thromboembolism (VTE) is a significant cause of morbidity, mortality and increased healthcare costs. Chronic obstructive pulmonary disease (COPD) increases risk of thromboembolism, however, there is limited documentation on compliance with VTE prophylaxis guidelines in patients admitted with an infective exacerbation of COPD. *Objective:* Determine compliance with National Health and Medical Research Council (NHMRC) VTE prophylaxis guidelines in patients admitted with an infective exacerbation of COPD at a metropolitan hospital in Western Australia. *Methods:* A random sample of 40 patients with an infective exacerbation of COPD was audited for compliance with NHMRC VTE prophylaxis guidelines. *Results:* The audit highlighted nominal compliance with documentation of VTE prophylaxis risk assessment (2.5%), documentation of VTE prophylaxis contraindication (0%) and prescription of pharmacological prophylaxis (27.5%). Prophylaxis was prescribed and administered appropriately (correct agent, route & frequency) when it was considered suitable for a patient. *Conclusions:* There is nominal adherence to VTE prophylaxis guidelines in patients admitted with an infective exacerbation of COPD. VTE prophylaxis compliance rates are steadily increasing within the surgical specialities. This audit highlights the need for quality improvement interventions to increase VTE prophylaxis compliance in patients hospitalized with an infective exacerbation of patients.

Subjects: General Medicine; Gerontology; Hematology; Pulmonary Medicine

Keywords: venous thromboembolism; prophylaxis prescription COPD; VTE guidelines; NHMRC venous thromboembolism prophylaxis guidelines

ABOUT THE AUTHOR

Anmol Khanna is a medical doctor based in Western Australia. He is interested in research on venous thromboembolism. This article is part of a wider research comparing adherence to VTE prophylaxis guidelines within different medical specialities.

PUBLIC INTEREST STATEMENT

Blood clot in the lung increases healthcare costs and may be fatal. Patients with chronic obstructive pulmonary disease (COPD) are at a higher risk of developing clots in deep veins of arm, leg and pelvis. These clots are preventable. Experts have agreed on guidelines to prevent blood clots, however, there is limited research on compliance with these guidelines in COPD patients admitted with an infection. The research work in this paper identifies low adherence to these guidelines. This research informs policy makers that quality improvement interventions are needed to prevent blood clots in COPD patients admitted with an infection.

1. Introduction

Venous thromboembolism (VTE) is a significant cause of morbidity, mortality and increased health care costs (National Institute of Clinical Studies, 2003). A community-based study in Perth identified the incidence of VTE 0.83 (95% CI, 0.69–0.97) per 1,000 residents per year (Ho, Hankey, & Eikelboom, 2008). This is consistent with the incidence of VTE in United States (White, 2003). Chronic obstructive pulmonary disease (COPD) stage is associated with a 2-fold increased risk of VTE (Børvik, Brækkan, & Enga, 2016). Limited data is available on compliance with VTE prophylaxis guidelines in COPD patients. The objective of this study was to determine compliance with National Health and Medical Research Council (NHMRC) VTE prophylaxis guidelines in patients admitted with an infective exacerbation of COPD. Infections predispose patients to VTE due to increase in systemic inflammation. There is no evidence to support alteration of VTE risk based on infection type and the type of infection was outside the scope of this study.

1.1. Aim

This audit aims to assess whether quality control groups need to implement interventions for improving VTE prophylaxis and reducing morbidity and mortality of COPD patients.

1.2. Objective

Determine compliance with NHMRC VTE prophylaxis guidelines in patients admitted with an infective exacerbation of COPD at a metropolitan hospital in Western Australia.

2. Methods

2.1. Standard

A random sample of 40 patients admitted with an infective exacerbation of COPD was audited to verify compliance with NHMRC VTE prophylaxis guidelines. NHMRC develops healthcare standards in Australia. They identify acute chest infection as a risk factor for VTE and recommend that patients with an infective exacerbation of COPD should receive VTE prophylaxis (National Health & Medical Research Council, 2009). NHMRC guidelines are in agreement with the guidelines recommended by American College of Chest Physicians (American College of Chest Physicians, 2008).

2.2. Case selection

Patients admitted with an infective exacerbation of COPD between 1 September 2015 and 31 December 2015 were assigned a number based on their admission date. An excel script was used to generate 40 random numbers and the corresponding patients were audited.

Sample size of 40 patients was recommended by the respiratory physicians at the hospital. Approximately 250 patients are admitted to the hospital with an infective exacerbation of COPD every year. The sample size is approximately 16% of the yearly admissions with a confidence level of 90 and a 12% margin of error.

2.3. Case definition

Patients admitted 1 September 2015 and 31 December 2015 with an infective exacerbation of COPD.

Inclusion criteria

- Information from the most recent admission was used when a patient had multiple admissions.

Exclusion criteria

- Patients on therapeutic VTE therapy prior to admission.

2.4. Data collection

Information specified in Table 1 was collected from patient notes and medication chart and recorded in an excel spread sheet. Excel formulas were used to calculate the key outcomes.

Table 1. Information captured from medication charts and patient notes

Information captured from medication chart/ progress notes	Format captured information stored
Date of birth	dd/mm/yyyy
Sex	Male, female, data missing
Date of admission	dd/mm/yyyy
Was “VTE risk assessment” checkbox ticked on medication chart?	Yes, No
Was “contraindicated” checkbox ticked on medication chart?	Yes, No
What was reason for contraindication of pharmacological VTE prophylaxis documented in progress notes?	Reason, reason not documented
What was prescribed pharmacological VTE prophylaxis?	Low molecular weight heparin, unfractionated heparin, other, not prescribed
What was dose of the prescribed pharmacological VTE prophylaxis?	Dose, dose not prescribed
What was route of the prescribed pharmacological VTE prophylaxis?	Subcutaneous, per oral, other, not prescribed
What was prescribed frequency of the pharmacological VTE prophylaxis?	Once daily, twice daily, other, frequency not prescribed
Was prescribed pharmacological VTE prophylaxis administered?	Administered, not administered, administered at incorrect time
Was mechanical VTE prophylaxis prescribed?	Yes, no
Was mechanical VTE prophylaxis administered?	Yes, no

3. Results

The audit highlighted nominal compliance with documentation of VTE prophylaxis risk assessment (2.5%), documentation of VTE prophylaxis contraindication (0%) and prescription of pharmacological prophylaxis (27.5%). Prophylaxis was prescribed and administered appropriately (correct agent, route and frequency) when it was considered suitable for a patient (Table 2).

Medication chart checkbox indicating completion of VTE prophylaxis risk assessment was marked for one out of 40 patients. None of the patients had contraindications to VTE prophylaxis documented in the medication chart or the patient notes. 11 out of 40 patients were prescribed VTE prophylaxis. 10 out of 11 patients were prescribed prophylaxis in the VTE prophylaxis section of the medication chart. One patient was prescribed it in the regular medication section of the medication chart. Pharmacological prophylaxis was appropriately administered to each of the 11 patients. Mechanical prophylaxis was not prescribed to any patient in the relevant section of the medication chart. Two patients were prescribed mechanical prophylaxis in patient notes.

4. Discussion

Results obtained from audits both in Australia as well as overseas demonstrate that adherence to VTE prophylaxis guidelines is lower for patients with an infective exacerbation of COPD when compared to other non-surgical/medical patients. Audit of 8,774 non-surgical patients across 15 hospitals in Australia identified 37.9% patients received appropriate thromboprophylaxis (Gibbs, Fletcher, Blombery, Collins, & Wheatley, 2011). Audit of 121 patients at Hôpital Tenon in Paris identified that 45.5% of medical patients received appropriate thromboprophylaxis (Fagot et al., 2001). The result of this audit (highlighting poor compliance with VTE guidelines) is in line with other audits in COPD patients indicating poor compliance with other international clinical guidelines (Lodewijckx et al., 2009; Sandhu et al., 2013).

Table 2. Key outcomes of the audit

	Eligible patients	Patients compliant	Percentage compliance (%)
VTE Risk assessment documented in medication chart	40	1	$1/40 \times 100 = 2.5$
Contraindication documented in medication chart	29 (40–11 prescribed prophylaxis)	0	$0/29 \times 100 = 0$
Contraindication documented in patient notes	29 (40–11 prescribed prophylaxis)	0	$0/29 \times 100 = 0$
Pharmacological prophylaxis prescribed	40	11	$11/40 \times 100 = 27.5$
Pharmacological prophylaxis administered as per prescription	11	11	$11/11 \times 100 = 100$

Physician disagreement with VTE guidelines, management of COPD patients by non-respiratory physicians and lack awareness that respiratory illness is a risk factor for VTE are the key reasons for poor compliance. Some physicians believe that VTE prophylaxis guidelines overstate the need for thromboprophylaxis in medical patients and expose them to unnecessary risk of bleeding (Millar, 2009). Respiratory physicians comply with VTE guidelines to a greater extent than general physicians (Lodewijckx et al., 2009; Sandhu et al., 2013), however, COPD patients are often managed by non-respiratory physicians.

Relatively small sample size was a limitation of this study and decreases reliability of the results. Despite this limitation, this study has several strengths. This is perhaps the first study determining compliance with VTE prophylaxis guidelines in COPD patients. It highlights the need for interventions to improve nominal adherence to VTE prophylaxis guidelines in COPD patients.

5. Conclusion

Hospitalized patients with an infective exacerbation of COPD patients are at an increased risk of developing a thrombotic event. VTE prophylaxis compliance is steadily increasing within the surgical specialities, however, there is nominal adherence to VTE prophylaxis guidelines in patients admitted with an infective exacerbation of COPD. Physician disagreement with the VTE guidelines in COPD patients, management of COPD patients by non-respiratory physicians and lack awareness that respiratory illness is a risk factor for VTE are the key reasons for poor adherence. This audit highlights the need for quality improvement interventions to increase compliance with VTE prophylaxis in hospitalized patients with an infective exacerbation of COPD.

Funding

The author received no direct funding for this research.

Competing Interests

The author declare no competing interest.

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Citation information

Cite this article as: Are we preventing VTE in patients with an infective exacerbation of chronic obstructive pulmonary disease - low adherence to VTE prophylaxis guidelines, Anmol Khanna, *Cogent Medicine* (2016), 3: 1242247.

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