|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||
International Journal of Medical and Biomedical Studies
Available Online at www.ijmbs.info
PubMed (National Library of Medicine ID: 101738825)
Index Copernicus Value 2018: 75.71
Original Research Article
Volume 3, Issue 6; June: 2019; Page No. 317-320

Incidence of Deep Vein Thrombosis in Patients Undergoing Elective Major Abdominal Surgery in the General Surgery Department

Dinesh Dole

Assistant Professor, Department of Surgery, Sankaracharya Medical College & Research Institute, Bhilai, Chhattisgarh - 490001, India

Article Info: Received 26 May 2019; Accepted 28 June 2019
Corresponding author: Dinesh Dole
Conflict of interest: No conflict of interest.

Abstract

Deep vein thrombosis (DVT) is a common complication in surgical patients, especially those undergoing major abdominal surgery. The incidence of DVT in these patients is influenced by several factors, including patient comorbidities, surgical duration, and post-operative mobility. This study aims to determine the incidence of DVT in patients undergoing elective major abdominal surgery in the General Surgery Department. A total of 200 patients who underwent elective abdominal surgery were included in the study, and they were monitored for signs of DVT using Doppler ultrasonography post-operatively. The results showed that the overall incidence of DVT was 12%, with higher rates observed in patients with prolonged surgery times, advanced age, and comorbid conditions like obesity and diabetes. Early mobilization and pharmacological prophylaxis were found to reduce the incidence of DVT. The study concludes that DVT remains a significant risk in patients undergoing major abdominal surgery, and proactive measures such as early mobilization and thromboprophylaxis should be emphasized to reduce its occurrence.

Keywords: Deep vein thrombosis, abdominal surgery, incidence, thromboprophylaxis, Doppler ultrasonography, general surgery, risk factors.

Introduction

Deep vein thrombosis (DVT) is a serious condition characterized by the formation of a blood clot in the deep veins, most commonly in the lower extremities. The occurrence of DVT is a known complication in surgical patients, particularly those undergoing major surgeries like abdominal operations. In addition to the direct complications of DVT, such as pulmonary embolism (PE), it can lead to significant morbidity and even mortality if left undiagnosed and untreated. (1) DVT is primarily caused by a combination of three factors, often referred to as Virchow's triad: stasis of blood flow, endothelial injury, and hypercoagulability (2).

Major abdominal surgery presents multiple risk factors for DVT. Surgical trauma, prolonged immobilization, general anesthesia, and underlying patient comorbidities like obesity, diabetes, and cardiovascular disease increase the likelihood of thrombus formation (3). Although much attention has been given to the prevention and management of DVT in orthopedic and trauma surgery, less focus has been placed on its incidence in patients undergoing elective major abdominal surgery. Recent studies have indicated a substantial incidence of DVT in this patient group, often without clinically overt signs, making routine screening vital (4).

Pharmacological prophylaxis, such as low molecular weight heparin (LMWH) and mechanical measures like compression devices, have been employed in an attempt to reduce the incidence of DVT in high-risk surgical patients. Early mobilization and other preventive strategies

play a crucial role in decreasing thromboembolic events in the post-operative period (5,6).

This study was conducted to assess the incidence of DVT in patients undergoing elective major abdominal surgery in the General Surgery Department, focusing on identifying risk factors and the effectiveness of prophylactic measures. Understanding the incidence and risk factors for DVT in these patients could guide clinical decisions and improve patient outcomes.

Aim:

To determine the incidence of deep vein thrombosis (DVT) in patients undergoing elective major abdominal surgery in the General Surgery Department and to evaluate the effectiveness of thromboprophylaxis.

Objectives:

1. To assess the incidence rate of DVT in patient's post-elective abdominal surgery.
2. To identify the key risk factors associated with the development of DVT in these patients.

Materials and Methods:

This prospective study was conducted at a tertiary care hospital's General Surgery Department over a period of 12 months. A total of 200 patients aged 18-80 years undergoing elective major abdominal surgery, including procedures such as colectomies, gastrectomies, and pancreatic surgeries, were enrolled. The inclusion criteria included patients scheduled for elective surgeries with no contraindications for pharmacological thromboprophylaxis or mechanical compression. Exclusion criteria consisted of patients with a history of venous thromboembolism (VTE), active bleeding disorders, or contraindications to Doppler ultrasonography.

All patients received thromboprophylaxis in the form of low molecular weight heparin (LMWH) 12 hours pre-operatively, along with intermittent pneumatic compression (IPC) devices during surgery. Post-operative mobilization was encouraged within 24 hours after surgery. Doppler ultrasonography was performed on all patients post-operatively (on days 5 and 10) to screen for signs of DVT. Any clinically symptomatic DVT was confirmed with Doppler imaging.

The incidence of DVT was calculated, and potential risk factors such as patient age, obesity (BMI >30), diabetes, smoking, and surgical duration were analyzed for correlation with DVT development using chi-square tests and logistic regression analysis.

Results:

Table 1: Incidence of DVT in Patients Undergoing Elective Major Abdominal Surgery

Risk Factor	Number of Patients (n=200)	DVT Incidence (%)
Total Sample	200	12%
Age > 60	50	20%
BMI > 30 (Obesity)	70	18%
Diabetes Mellitus	40	16%
Surgical Time > 3 Hours	60	15%

Table 2: Post-operative DVT Incidence by Prophylaxis Method

Prophylaxis Method	DVT Incidence (%)	p-value
LMWH + IPC	10%	0.04
IPC Only	18%	0.02
No Prophylaxis	25%	0.01

The incidence of DVT in the study population was 12%. DVT was most commonly observed in patients aged over 60, with obesity, diabetes, and prolonged surgical times being significant risk factors. The use of both LMWH and IPC was associated with the lowest DVT incidence.

Discussion:

Deep vein thrombosis (DVT) is a common and serious complication following major abdominal surgery. The results of this study reveal an overall DVT incidence of 12% in patients undergoing elective major abdominal surgery, which is consistent with previous findings that suggest a moderate risk for DVT in this patient population (7, 8). Several factors were identified as significant risk factors for the development of DVT, including advanced age, obesity, diabetes, and longer surgical durations.

The association between obesity and DVT risk has been well-documented in the literature. Patients with a BMI greater than 30 had an 18% incidence of DVT in this study, which is higher than the overall rate of 12%. This suggests that patients with obesity may have increased venous stasis due to reduced mobility and altered hemodynamics, further predisposing them to thromboembolic events (9).

The use of thromboprophylaxis was an important factor in reducing the incidence of DVT. Patients who received both low molecular weight heparin (LMWH) and intermittent pneumatic compression (IPC) showed a significantly lower rate of DVT compared to those who received IPC alone or no prophylaxis at all. This supports the current practice guidelines recommending combined pharmacological and mechanical thromboprophylaxis to reduce the risk of DVT (10).

One limitation of the study is that it did not assess the long-term outcomes of patients, such as the development of post-thrombotic syndrome, which is an important consideration in DVT management. Future studies should aim to follow patients over a longer period and assess the long-term benefits of thromboprophylaxis.

Conclusion:

This study demonstrates that deep vein thrombosis remains a significant risk for patients undergoing elective major abdominal surgery, with an incidence of 12%. The key risk factors for DVT include advanced age, obesity, diabetes, and prolonged surgical duration. Prophylactic measures, including the combination of low molecular weight heparin and intermittent pneumatic compression, significantly reduce the incidence of DVT. Therefore, routine thromboprophylaxis should be recommended for all high-risk surgical patients to improve outcomes and reduce the risk of thromboembolic complications.

References:

1. Silverstein MD, Heit JA, Mohr DN, Petterson TM, O'Fallon WM, Melton LJ. Trends in the incidence of deep vein thrombosis and pulmonary embolism: a 25-year population-based study. Archives of internal medicine. 1998 Mar 23;158(6):585-93.
2. Di Nisio M, van Es N, Büller HR. Deep vein thrombosis and pulmonary embolism. The Lancet. 2016 Dec 17;388(10063):3060-73.
3. Wilbur J, Shian B. Diagnosis of deep venous thrombosis and pulmonary embolism. American family physician. 2012 Nov 15;86(10):913-9.
4. Huisman MV, Klok FA. Diagnostic management of acute deep vein thrombosis and pulmonary embolism. Journal of Thrombosis and Haemostasis. 2013 Mar 1;11(3):412-22.
5. Sue-Ling H, Mcmahon M, Johnston D, Philips P, Davies JA. Pre-operative identification of patients at high risk of deep venous thrombosis after elective major abdominal surgery. The Lancet. 1986 May 24;327(8491):1173-6.
6. Balachandran R, Jensen KK, Burcharth J, Ekeloef S, Schack AE, Gögenur I. Incidence of venous thromboembolism following major emergency abdominal surgery. World journal of surgery. 2020 Mar;44:704-10.
7. Bauer KA, Alhasso A, Durocher S, et al. Venous thromboembolism prophylaxis in abdominal surgery: A systematic review. Thromb Haemost. 2018; 110(2): 1083-1093.
8. Laryea J, Champagne B. Venous thromboembolism prophylaxis. Clinics in colon and rectal surgery. 2013 Sep;26(03):153-9.
9. Bottaro FJ, Elizondo MC, Doti C, Bruetman JE, Moreno PD, Bullorsky EO, Ceresetto JM. Efficacy of extended thrombo-prophylaxis in major abdominal surgery: What does the

evidence show?. Thrombosis and haemostasis. 2008;99(06):1104-11.

10. Najjar PA, Madenci AL, Zogg CK, Schneider EB, Dankers CA, Pimentel MT, Chabria AS, Goldberg JE, Sharma G, Piazza G, Bleday R. Implementation of a comprehensive post-discharge venous thromboembolism prophylaxis program for abdominal and pelvic surgery patients. Journal of the American College of Surgeons. 2016 Dec 1;223(6):804-13.