

Venous thromboembolism in major lower limb orthopedic surgery

Venous thromboembolism (VTE) includes deep vein thrombosis (DVT) and pulmonary embolism (PE). It is the 3rd leading cause of death from cardiovascular causes after myocardial infarction and stroke.¹ VTE represents a global problem, especially in western population, where it has been studied and documented extensively. The most feared complication in lower limb orthopedic surgery in adults has been deep venous thrombosis (DVT), which may result in lethal pulmonary embolus. The incidence of venographic DVT and proximal DVT within 7-14 days of major lower limb orthopedic surgery in patients who have no thromboprophylaxis has been reported 40-60% and 10-30%, respectively. The symptomatic venous thromboembolism (VTE) is around 3-7% in various studies.² The use of thromboprophylaxis has brought down the rate of fatal PE to 0.1% in 90 days after surgery. The need of thromboprophylaxis after major orthopedic surgery has been well recognized in western literature and has become the standard of care. The uniformity of criteria along the specialties is lacking. There are insufficient data to either confirm or refute the hypothesis as to which thromboprophylaxis need to be used i.e. pharmacological VTE prophylaxis, mechanical thromboprophylaxis, or both? The evidence is also lacking in the choice of pharmacologic prophylaxis in the given situation. For example, pharmacological prophylaxis reduces the risk of PE by 75% in surgical patients and by 57% in medical patients. The mechanical prophylaxis with graduated compression stockings and intermittent pneumatic compression is also recommended as an alternative or in combination with pharmacological prophylaxis.³ Evidence-based studies are lacking on the choice of modalities for thromboprophylaxis.⁴

A conflict of interest exists in assessment of thromboprophylaxis as most of the studies are sponsored by industry. The qualitative conclusions in these studies are

favorable to the use of the sponsored prophylactic agents. In a systematic review, Lee *et al.* included 71 studies, and 52 were funded by industry, and only two had unfavorable conclusions.⁴ The controversy exists on risk factors as well: age, length of hospital stay, spinal injury, trauma, and injury severity scores remain controversial in different studies.^{5,6} There is no single best method to diagnose VTE, and thus, it affects its incidence as well.^{5,7-9} The recommended screening tests are fibrinogen uptake and D-dimer, and confirmatory tests are venography, color Doppler, MR angiography, CT venography etc. There exists a need to look into the various grey aspects of thromboprophylaxis. This requires evidence-based studies on each aspect of thromboprophylaxis.

Scarcity of Indian studies on VTE and thromboprophylaxis compels us to use the data, which is based on western population. The controversies still exist in these data as well. Very few studies are available on Indian patients with VTE and using thromboprophylaxis^{5,7,10} after orthopedic trauma surgery. Most of the Indian studies have small sample size (less than 100 patients).⁵

The Indian data regarding the incidence of VTE and duration of thromboprophylaxis have been heterogeneous and conflicting.⁷⁻¹⁰ The article by Nair *et al.* is a prospective study, which describes short term thromboprophylaxis (7-11 days) and extended prophylaxis (4 weeks) in Indian population in total hip and knee arthroplasty cases.¹¹ They concluded that extended thromboprophylaxis is more effective in reducing post-operative VTE.

Thromboprophylaxis in arthroscopy is controversial. Majority of surgeons do not use and recommend any form of thromboprophylaxis in routine knee arthroplasty unless significant risk factors are present. Abouali *et al.* from McMaster University has described a survey of thromboprophylaxis in routine arthroscopy of the knee.¹² This survey has very well pointed out the need for larger, well-designed randomized control trials, which focuses on more concise guidelines.

Thromboprophylaxis has not been a common practice by orthopedic fraternity in our country, which may be because of complex reasons, lack of published data in Indian patients, surgeons' poor awareness, complexities of anti-coagulation therapy, lack of genetic studies of cases etc. We

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need to have multicentric, large, and randomized control clinical studies in the most common procedure besides proximal femoral fracture and joint replacement surgery. This will evolve formal strategies for prevention of venous thrombosis and improve the standard of care in our patients.

Sudhir Kumar

*Editor, Indian Journal of Orthopedics
Professor and Head,
Department of Orthopedics,
University College of Medical Sciences and GTB Hospital,
University of Delhi, Delhi - 110 095, India*

Address for correspondence: Dr. Sudhir Kumar,
Editor, Indian Journal of Orthopedics
Professor and Head,
Department of Orthopedics,
University College of Medical Sciences and GTB Hospital,
University of Delhi, Delhi - 110 095, India.
E-mail: profsudhirkumar@gmail.com

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