



Thromboprophylaxis after knee arthroscopy and lower leg casting

Patients with arthroscopic knee surgery or casting of the lower legs are at increased risk of venous thromboembolism (VTE) [1, 2]. But there is an ongoing debate on the benefits and risks of anticoagulation to prevent symptomatic deep vein thrombosis (DVT) and pulmonary embolism (PE) with these indications.

van Adrichem et al. recently published two trials comparing low molecular weight heparin (LMWH) or no anticoagulant therapy for the prevention of VTE [3]. The “POT-KAST” (The Prevention of Thrombosis after Knee Arthroscopy) and “POT-CAST” (The Prevention of Thrombosis after Lower Leg Plaster Cast) studies were two randomized open-label trials with blinded outcome evaluation conducted at ten hospitals in the Netherlands. The study design was similar, with broad inclusion criteria and few exclusion criteria. POT-KAST enrolled 1,543 patients undergoing knee arthroscopy between May 2012 and January 2016 and POT-CAST enrolled 1,519 patients treated with casting of the lower leg between March 2012 and January 2016. Patients in both trials were randomized to receive prophylactic LMWH or no anticoagulant therapy for eight days after knee arthroscopy or during the complete period of casting of the lower leg. In both trials, patients in the treatment group received nadroparin (2850 IU) or dalteparin (2500 IU) (a double dose was used for patients who weighed more than 100 kg). Primary outcome measures were symptomatic DVT, PE, and major bleeding within a time frame of three months.

In POT-KAST, 56% of the study population were male, the mean age was 48.5 ± 12.5 years. The majority of patients (77%) underwent meniscectomy. Symptomatic VTE occurred in five out of the 731 patients (0.7%) in the treatment group and in three out of the 720 patients in the control group (0.4%). In the per-protocol analysis, symptomatic VTE was confirmed in four patients (0.6%) in the treatment group and in three patients (0.4%) in the control group. Major bleeding occurred in one patient in each group, rates of minor bleeding were 9.5% in the treatment group and 5.4% in the control group. All VTE in the POT-KAST trial occurred after the treatment period of eight days.

In the POT-CAST trial, 50% of the patients were male, the mean age was 46 ± 16.5 years. In most of the cases (89%), a fracture was the reason for casting of the lower leg. Symptomatic VTE occurred in 10 out of 719 patients (1.4%, 6 DVT, 3 PE, 1 both) in the treatment group and in 13 out of the 716 patients (1.8%, 8 DVT, 4 PE, 1 both) in the control group. The per-protocol analysis showed a similar relative risk. Patients with symptomatic VTE were more

likely to present with other risk factors such as older age, hormone use, and a family history of VTE. Rates of major bleeding were not significantly different between the two groups (minor bleeding 7.6% in the treatment group and 6.8% in the control group). In the POT-CAST trial, nine out of the 23 patients with symptomatic VTE suffered from symptoms after the cast had been removed; six of these nine patients had been treated with LMWH.

The cumulative incidence of symptomatic VTE within three months (primary outcome) after the procedure was not significantly different between the two groups in either trial. Therefore the authors conclude that a prophylactic regimen of LMWH after knee arthroscopy or cast for eight days after the procedure was not effective for the prevention of symptomatic VTE.

In the current German guidelines, thromboprophylaxis is not generally recommended after knee arthroscopy as long as there is no immobilization and there are no additional risk factors [4]. Data from prospective randomized trials is very limited. A previously published meta-analysis, including four small randomized controlled trials (between 36 and 239 participants), suggested a beneficial effect of anticoagulant therapy (LMWH vs. no anticoagulant therapy) in patients undergoing knee arthroscopy [5]. Most patients suffered from distal DVT. Incidence of VTE varied from 0.6% to 17.9% depending on the screening method. A very low incidence of symptomatic VTE after arthroscopy was reported in both treatment arms of the POT-KAST study. Because no duplex sonographic screening for thrombosis had been performed, it may be suggested that the real incidence of DVT is underestimated.

Comparing the data of POT-KAST and POT-CAST, the risk of symptomatic VTE was higher after casting than after arthroscopy. In the German guidelines, thromboprophylaxis after casting is recommended; however, there is only little evidence in the literature. A recent meta-analysis observed symptomatic VTE in 2.5% of patients without anticoagulant thromboprophylaxis, another trial found symptomatic VTE in 1% of the patients [2, 6]. These results are comparable with the results from the POT-CAST trial, with an incidence of symptomatic VTE of 1.8% in patients not treated with LMWH [3].

Although it can be assumed that the incidence of true VTE is higher in the POT-CAST trial, because no routine duplex sonographic scan has been performed, this concerns both treatment arms. It is remarkable that there was no difference between patients with and without LMWH

application. These results suggest that LMWH prophylaxis in unselected patients with lower leg casting may have no benefit in preventing VTE.

But it should be mentioned that the presence of risk factors can influence the recommendation. Especially since other risk factors such as older age, hormone use, and family history of venous thromboembolism were present in the patients with a VTE in the POT-CAST cohort, analyses of subgroups could have led to different results regarding the benefit of LMWH.

Furthermore, the duration of prophylaxis might have been too short to show a beneficial effect, since most of the patients who presented with symptomatic VTE did so after the treatment period.

Although the results from the POT-CAST and POT-KAST studies add important research to the field, they also raise new questions. Determining the optimal duration of anticoagulant therapy and identifying patients with additional risk factors remains crucial in preventing VTE, particularly after casting.

References

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