

Prevention of thromboembolic complications in women undergoing gynecologic surgery

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Received August 13, 1996; revised manuscript accepted for publication March 12, 1997

Summary

Our objective was to identify those patients particularly at risk of deep vein thrombosis (DVT) before they underwent extensive gynecologic surgery and to control if, a correct diagnostic analysis and a right pre-operative prophylaxis of patients with risk of developing DVT, was enough to improve post-operative prognosis. Of 2704 patients undergoing gynaecological surgery, 74 were pre-operatively considered at risk of developing DVT. Seventy percent of the patients received pre- and postoperative heparin, while 28% of the women received only postoperative heparin. Nonetheless, seven women receiving this prophylaxis developed DVT. The final results of our study demonstrate that there is a close correlation between incidence of DVT and the presence of risk factors. This incidence can be reduced by prophylactic measures such as elastic stockings for the lower legs, early post-operative mobilization, hematocrit and volemia control, ending with pharmacological therapy with heparin.

Key words: Deep vein thrombosis; Heparin prophylaxis; Hysterectomy; Pulmonary embolism.

Introduction

Several studies on the incidence of postoperative thrombosis of the deep veins of the legs in gynecologic surgery, have showed the importance of heparin prophylaxis [1, 2, 3]. The intention of heparin is to prevent deep vein thrombosis (DVT) and pulmonary embolism (P.E.) without causing bleeding [1]. Still today, several surgeons, are not sure of the benefits of heparin prophylaxis, above all concerning doubts due to bleeding complications. The incidence of post-operative DVT in gynecologic patients without heparin prophylaxis has been found to vary between 14 and 29% [4]. DVT led to clinical symptoms occurring in gynecologic surgery in only 40% of women, while thrombosis occurred in 70% with no clinical signs [5, 6]. Therefore the control of thromboembolic disease depends upon analysis of risk factors, laboratory and instrumental results, pre- and post-operative therapeutic and prophylactic measures. Our object was to identify those patients particularly at risk of DVT before undergoing extensive gynecologic operations and to control if, a correct diagnostic analysis and a right pre-operative prophylaxis of patients with risk of developing DVT, is enough to improve postoperative prognosis.

Materials and Methods

Between 1 January, 1990 to 31 December, 1994, 2,704 patients undergoing gynaecological surgery, laparotomy, colposuspension, vaginal plasty, admitted to the II Clinic of Gynaecology and Obstetrics of the University "La Sapienza", Rome, were studied. Seventy-four patients (3.4%) were considered preoperatively at risk of developing DVT. All women undergoing major gynecologic surgery for tumoral pathology, were excluded from our study. They were also excluded if they had hemorrhagic diathesis, known antithrombinic deficiency, recent

cerebro-vascular haemorrhage and hypersensitivity to heparin. Patient history, age, weight, height, physical examination, temperature, history of DVT, pulmonary embolism, and presence of varicose veins were recorded. Preoperative and postoperative haemoglobin level, fibrinogen concentration, and antithrombin III, using laboratory methods and electroimmunoassay, were determined. All women underwent pre- and postoperative Doppler sonography of the legs. Median age was 55 years (range 28-80), height 165 cm (153-174), and weight 65 Kg (56-85). Eleven patients out of 74 (15%) had a previous history of DVT and 45 out of 74 (64%) had varicose veins of the legs. Sixty-two of the patients were given pre- and postoperative 5,000 IU of unfractionated heparin, nine patients 15,000 IU, and only one patient 25,000 IU. Forty-two patients were mobilized 24 hours postoperatively. For 35 women elastic stockings were fitted and applied one day before surgery and were worn throughout the operation and the postoperative period until the patient was fully discharged (Tab. 1). Twenty-nine women underwent abdominal hysterectomy with bilateral salpingo-oophorectomy for uterine fibromatosis; 24 women underwent vaginal hysterectomy with anterior and posterior vaginal plasty for genital prolapse, and the remaining 21 underwent minor operations (Tab. 2).

Results

Seven of the 74 patients (9.5%) considered at risk of DVT developed clinical and instrumental evidence of deep vein thrombosis. In the literature the incidence of DVT, after gynecologic surgery, varied between 14 and 29% [4]. All women who developed DVT were overweight and older, while their height and weight were comparable with those patients in the non-thrombotic group. Patients who developed thrombosis had varicose veins and a previous history of DVT. Five of the seven women with DVT were affected by uterine fibromatosis and successfully underwent abdominal hysterectomy with bilate-

ral salpingo-oophorectomy (OSB) while the other two patients with DVT underwent vaginal hysterectomy with OSB and vaginal plasty for total genital prolapse. The result of laboratory exams performed pre- and postoperatively showed significant differences between patients who developed DVT and those who did not. The fibrinogen level and platelet count, in the postoperative period, increased significantly and AT III decreased. All women in our study underwent Doppler sonography of legs, pre- and postoperatively and 80% of the women with DVT presented circulatory disorders. Fever was present in the postoperative period in the seven women with DVT: five for DVT, and two due to infection by suture. Women positive for DVT received unfractionated heparin (UH) varying between 5,000 UI every 8 hours and 12,500 IU every 12 hours; heparin prophylaxis was associated with antibiotic therapy.

Table 1. — *Type of prophylaxis*

	N	%
Pre-operative heparin	52	70
Post-operative heparin	72	98
Early mobilization	42	56
Elastic stockings	35	47

Table 2. — *Type of surgery*

	N	%
Abdominal hysterectomy with adnexal preservation	12	16
Abdominal hysterectomy + bilateral salpingo-oophorectomy	29	40
Vaginal hysterectomy + bilateral salpingo-oophorectomy + vaginal plasty	24	32
Vaginal plasty	3	4
Myomectomy	6	8

Discussion

The variations of pre- and postoperative laboratory parameters, the correlation between disease and type of operation, the history and evolution of previous deep vein thrombosis in our study show the importance of "prevention" [2, 7, 8, 9]. It is still not clear if all patients undergoing gynaecological surgery should be treated or if only the patients with major risk of developing DVT should be selected for heparinic therapy [10, 11]. The last standard seems to be favoured beyond every cost-advantage evaluation. Seventy percent of patients received pre- and postoperative heparin while 28% (20/74) of the women received only postoperative, and even with this prophylaxis seven women developed DVT. No bleeding complications were observed confirming that a low dose of heparin has a prevalent antithrombotic action and not anticoagulant action; therefore there is no correlation between heparin activity and bleeding complications [2]. Some clinical parameters and hemostasis tests performed preoperatively were different for women with and without DVT. All women with postoperative deep vein

thrombosis had a previous history of DVT, presence of varicose veins, increased hematocrit level, disorder of platelet count and fibrinogen level, decreased ATIII, and a thrombosis-positive Doppler sonography. Even if important differences in pre-operative values or post-operative changes were observed between women with or without DVT, there was no single test which predicted DVT in each patient [4]. It is important to control women with risk factors of DVT, submit patients to heparinic prophylaxis, and reduce the incidence of postoperative thrombosis that in the literature varies between 14 and 29% without heparin prophylaxis [4]. Our study showed a correlation between the type of operation and development of DVT. Five women undergoing abdominal hysterectomy with OSB for uterine fibromatosis, and two patients undergoing vaginal hysterectomy with OSB and vaginal plasty developed postoperative deep vein thrombosis. Several studies have indicated hysterectomy as a risk factor for DVT [12]. The uterus represents an organ with high fibrinolytic activity and therefore hysterectomy might alter the fibrinolytic balance [13]. The pathogenic mechanisms for the increased risk of thrombosis after hysterectomy with OSB have not been clarified. Low estrogen caused by ovarian insufficiency has been discussed as one possible mechanism [14, 15]. A decrease in fibrinolytic activity of plasma is associated with an increased risk of thromboembolic disease and estrogens can increase the fibrinolytic activity [14, 15, 16]. Our analysis has led us to consider pre- and postoperative administration of heparin as a key element. Besides reducing the risk of thromboembolic disease, heparin favours a short-time patient hospitalization, a smaller relation cost-advantage with regard to a possible extended hospitalization and longer lasting pharmacological therapy, a major control of postoperative complications, a reduction of hemorrhagic phenomena and operation security. The final results of our study demonstrate that there is a close correlation between the incidence of DVT and the presence of risk factors, and this incidence can be reduced by prophylactic measures such as elastic stockings on the lower legs, early post-operative mobilization, hematocrit and volemy control, and pharmacological therapy with heparin.

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