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## Case Report

# Pulmonary embolism due to exogenous estrogen intoxication



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## ABSTRACT

**Objective:** Pulmonary embolism is a relatively common clinical presentation of venous thromboembolism, which develops in relation to acute pulmonary arterial occlusion mostly caused by thrombi of the lower limbs.

**Case report:** 29 year old female admitted to emergency department with pulmonary thromboembolism due to an ingestion of 17 Diana 35 pills (2 mg cyproterone acetate and 0.035 mg ethinyl estradiol) in a suicide attempt without any previously known predisposing factors. After thrombolytic therapy, the patient was discharged with oral warfarin treatment.

**Discussion:** We know that exogenous estrogen increase the risk of venous thromboembolism in therapeutic use. It should be kept in mind that even single ingestion of a single high-dose exogenous estrogen intake may induce pulmonary thromboembolism.

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## 1. Introduction

Venous thromboembolism (VTE) is a fatal and multi-factorial disease which presents with serious complications [1]. Pulmonary embolism can be a relatively common clinical presentation identified as a type of venous thromboembolism, which develops in relation to acute pulmonary arterial occlusion mostly caused by thrombi of the lower limbs. Nearly 50% of patients with proximal “deep vein thrombosis” (DVT) may develop pulmonary embolisms which usually do not present with clinical symptoms and show up in lung scintigraphy [2]. According to prospective cohort studies, the mortality rate for PE in acute patients ranges from 7% to 11% [3]. The major risk factors for pulmonary embolism include major surgery, advanced age, immobilization, genetic predisposition, cancer, “oral contraceptives” (OC) or hormone replacement therapy, pregnancy and trauma. Herein, we report a case of an acute pulmonary embolism occurring after the ingestion of 17 Diana-35 pills (2 mg cyproterone acetate and 0.035 mg ethinyl estradiol) in a suicide attempt without any previously known predisposing factors.

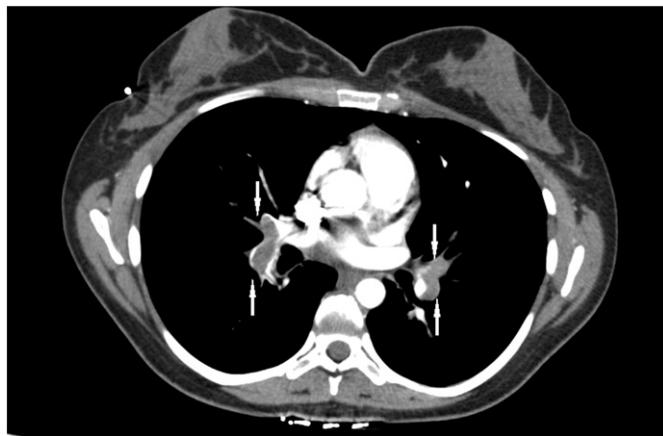
## 2. Case report

A 29-year-old female patient was admitted to our emergency department with complaints of dyspnea, palpitation, and syncope. The patient's history revealed an ingestion of 17 Diana 35® (2 mg

cyproterone acetate and 0.035 mg ethinyl estradiol) pills in an attempt for suicide three days ago and after a short-term follow-up, she was discharged with some recommendations. At her initial admission, the patient's arterial blood pressure was 80/50 mm Hg, pulse 121 bpm, respiratory rate 18 breaths/min and sPO<sub>2</sub> (finger) 90%. Neurological examination findings were normal and bilateral minimal fine crackles were present in each hemithorax on lung auscultation. There were no findings suggesting deep vein thrombosis in the peripheral vascular examination. Other system examinations were normal. Laboratory analysis revealed as follows: D-Dimer: above the upper limit of the laboratory, pH: 7.51, pO<sub>2</sub>: 57.7%, pCO<sub>2</sub>: 23.3% HCO<sub>3</sub>: 18.6 mmol/L, sPO<sub>2</sub>: 91%, and Lactat: 3.7. There were sinus tachycardia on electrocardiography and T negative on D1, D2, D3, V3, V4, V5, and V6 waves (Fig. 1). Echocardiography revealed a minimal increase in the right heart chambers and pulmonary artery pressure (PAP) was 30 mm Hg without any suggestive finding of deep vein thrombosis in the lower limb venous Doppler examination. In the high-contrast chest angiography to examine possible pulmonary embolism, filling defects at bilateral pulmonary arterial bifurcation levels consistent with pulmonary embolism of the lobar branches were seen (Fig. 1). The patient was investigated for underlying conditions which may lead to pulmonary embolism. The levels of protein C, S, factor V Leiden mutation, homocysteine, antithrombin and anticardiolipin antibodies were normal. As a result, embolism was thought to be caused by medication taken for the suicide attempt. Embolectomy was not performed and thrombolytic treatment with alteplase infusion 100 mg was initiated over 2 h, followed by warfarin 5 mg once daily and enoxaparin 0.6 cm<sup>3</sup> twice a day. The patient was

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**Fig. 1.** Contrasted Thorax CT showing thrombus in bilateral pulmonary arteries.

discharged with warfarin treatment, when her INR values returned to the targeted level of 2.5 during the two day intensive care stay and three day in-hospital follow-up.

### 3. Discussion

Although VTE is seen in both sexes, it mostly affects young women and 47% of the patients with VTE have no predisposing factors [4]. It may develop as a result of several factors such as surgical operations, malignancies, chronic cardiac or respiratory failure, pregnancy, immobilization, OC and hormone replacement therapy use [5]. In this case, our patient was investigated for deep vein thrombosis, which may lead to venous thromboembolism, using Doppler ultrasonography which yielded negative findings. In addition, laboratory tests were also performed to exclude other diseases which may be prone to thrombosis and the findings were negative.

Hormone replacement therapy and the use of OCs are major factors known to increase the risk of VTE; the risk increases depending on the dose of estrogen [5,6]. The amount of endogenous estrogen and testosterone does not increase the risk of embolism and that exogenous estrogen significantly increases the risk of venous thromboembolism [7]. Our patient had pulmonary embolism which likely resulted from a single high-dose exogenous estrogen intake.

Treatment of pulmonary embolism may vary according to the clinical condition of the patient. Supportive therapy, thrombolytics, anticoagulation and embolectomy are available options in the treatment of acute pulmonary embolism. Anticoagulation and venous filter treatment can be scheduled in the long-term to prevent recurrent embolisms. Similarly, supportive therapy, thrombolytic and anticoagulant therapy were initiated in this case and the patient was followed with long-term use of warfarin. But we also know that despite the anticoagulation therapy recurrent embolism could be seen; REVERSE study indicates that estrogen use increases the risk of VTE but the risk of recurrent VTE is low in women after first otherwise unprovoked estrogen associated VTE [8].

In conclusion, it should be kept in mind that therapeutic or high-dose exogenous estrogen intake may trigger the development of thromboembolisms and exogenous estrogen intake should be questioned in patients admitted to the emergency department with symptoms suggestive of pulmonary embolism.

### Disclosure statement

No potential conflict of interest was reported by the authors.

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