


## Effectiveness and Safety of Direct Oral Anticoagulants versus Warfarin in Obese Patients with Acute Venous Thromboembolism

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# Background

- Studies on the use of direct oral anticoagulants (DOACs) in obese patients are limited.
- Current guidelines advise against DOAC use in patients with a body weight more than 120 kg or body mass index higher than 40 kg/m<sup>2</sup>.

# Aim of the study

- To evaluate the effectiveness and safety of DOACs versus warfarin for the treatment of acute venous thromboembolism (VTE) in obese patients.

# Methods

- Retrospective matched cohort study.
- A total of 1840 adults with a primary admission diagnosis of acute VTE who received a DOAC (apixaban, dabigatran, or rivaroxaban [632 patients]) or warfarin (1208 patients), and who had a body weight more than 100 kg and less than 300 kg, were included.
- The primary outcome was recurrence of VTE within 12 months of the index admission date.
- Secondary outcomes included occurrence of pulmonary embolism (PE) and deep vein thrombosis (DVT) events separately within the study time frame, as well as bleeding within 12 months of the index admission date.

# Results (I)

- Rivaroxaban represented most DOAC cases (580 patients [91.8%]) followed by apixaban (33 patients [5.2%]) and dabigatran (19 patients [3%]).
- No significant differences were observed between groups, except for cancer history, which was higher in the DOAC group.
- The distribution of BMI between the warfarin and DOAC groups was similar.

**Table 1. Baseline Characteristics of the Study Patients**

Characteristic	DOAC group (n=632)	Warfarin group (n=1208)	p Value <sup>a</sup>
Age, yrs	55 (46-65)	55 (45-65)	0.64
Female	216 (34.2)	434 (35.9)	0.46
White race	546 (86.4)	1055 (87.3)	0.57
Weight, kg	115 (106-132)	116 (107-132)	0.11
> 120	264 (41.8)	497 (41.1)	0.79
> 200 and < 300	7 (1.1)	25 (2.1)	0.13
BMI, <sup>b</sup> kg/m <sup>2</sup>	38.8 (34.0-44.5)	39.2 (34.4-45.3)	0.44
30 < BMI ≤ 35	98 (23.3)	179 (23.7)	
35 < BMI ≤ 39	113 (26.9)	197 (26.1)	
BMI > 40	183 (43.6)	342 (45.3)	
History of CKD	36 (5.7)	56 (4.6)	0.32
History of VTE	132 (20.9)	237 (19.6)	0.52
History of cancer	45 (7.1)	40 (3.3)	<0.001
Home anticoagulant <sup>c</sup>	120 (19)	152 (12.6)	<0.001

Data are median (interquartile range) values or no. (%) of patients.

BMI = body mass index; CKD = chronic kidney disease; DOAC = direct oral anticoagulant; VTE = venous thromboembolism.

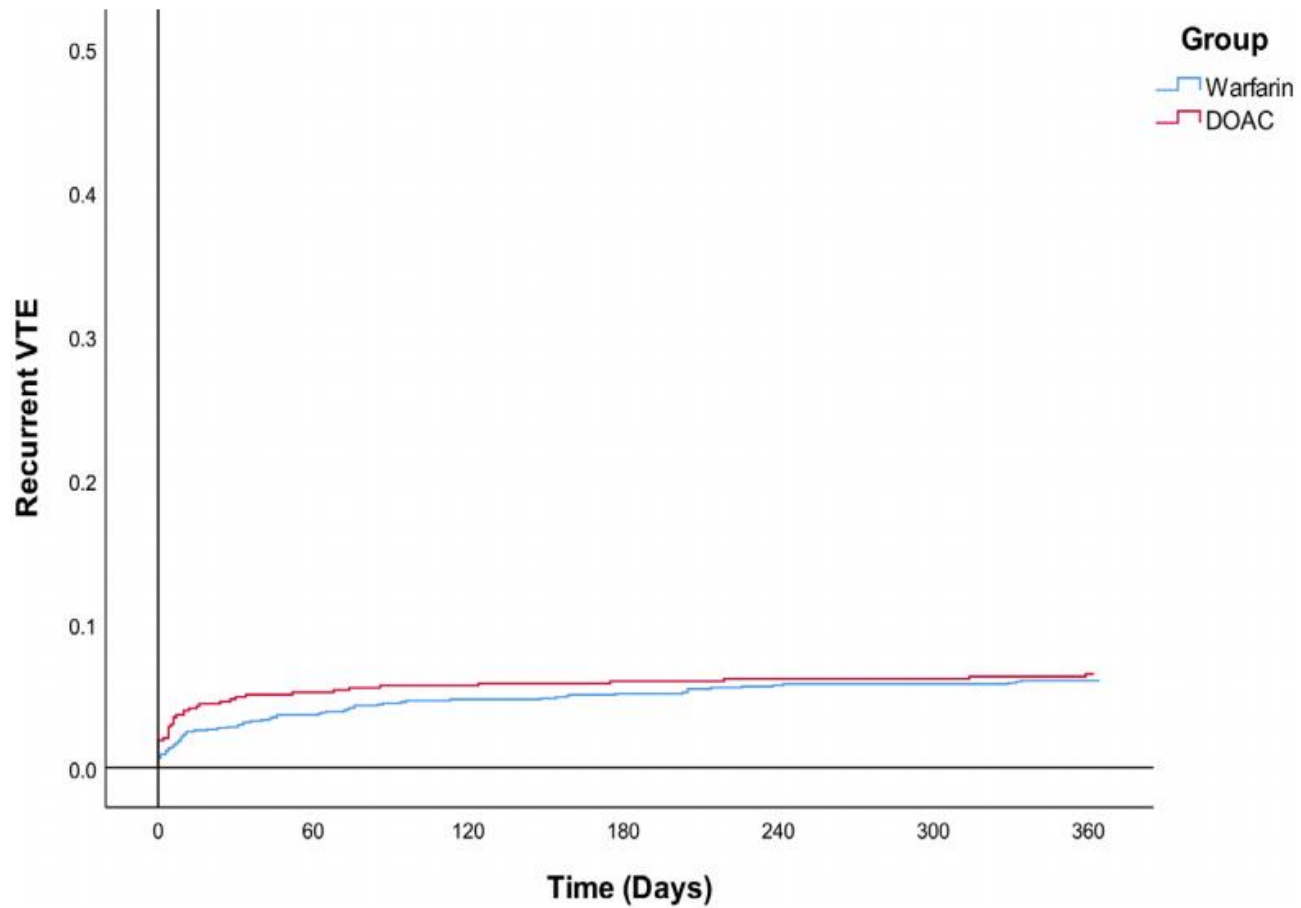
<sup>a</sup>The  $\chi^2$  test was used for categorical data; the Mann-Whitney *U* test was used for continuous data.

<sup>b</sup>BMI was available for 420 patients in the DOAC group and 755 patients in the warfarin group.

<sup>c</sup>Home anticoagulant included either a DOAC or warfarin.

# Results (II)

- No significant difference in the recurrence of VTE was observed between patients who received a DOAC compared with those who received warfarin (6.5% vs 6.4%,  $p=0.93$ ).
- No significant differences in the occurrence of PE and DVT were seen between the DOAC- and warfarin-treated patients (3.7% vs 3.8%,  $p=0.94$ , and 3% vs 3.5%,  $p=0.56$ , respectively).
- Bleeding occurred in 1.7% and 1.2% of patients in the DOAC and warfarin groups, respectively ( $p=0.31$ ).



**Figure 2.** Time to venous thromboembolism (VTE) recurrence within 12 months of the index admission date for the direct oral anticoagulant (DOAC) and warfarin groups.



**Table 2. Types of Bleeding-Related Hospital Readmissions and Emergency Department Visits**

Type of bleed <sup>a</sup>	Warfarin group (n=632)	Direct oral anticoagulant group (n=1208)	p Value
Total bleeding events	14 (1.2)	11 (1.7)	0.31 <sup>b</sup>
Gastrointestinal	7	4	
Epistaxis	1	0	
Genitourinary	2	5	
Intracranial/ Subarachnoid/ Subdural	1	0	
Hemoptysis	1	2	
Injury	2	0	

Data are no. (%) of patients or nos. of patients.

<sup>a</sup>Nonelective readmission plus the presence of a primary admission ICD-9-CM or ICD-10-CM code for bleeding within 1 year of the index venous thromboembolism admission by treatment group.

<sup>b</sup>The  $\chi^2$  test was used for categorical data.

# Conclusions

- This is the largest clinical study to date showing that patients with obesity can be treated effectively and safely with a DOAC compared with warfarin for acute VTE.
- DOACs should be considered a reasonable alternative to warfarin in obese patients who require anticoagulation for acute VTE treatment.