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Comparative Study between Rivaroxaban and Warfarin in Treatment of Patients with Recurrent Deep Venous Thrombosis

MOHAMED M.R. YOUSEF, M.Sc.; KAREM F. ABDELMOETY, M.D. and ASHRAF A. MOSTAFA, M.D.

The Department of General Surgery, Faculty of Medicine, Ain Shams University

Abstract

Background: Venous Thrombo-Embolism (VTE) manifests as Deep Venous Thrombosis (DVT) and/or Pulmonary Embolism (PE). Per 1000 persons in the general population, the annual incidence is 1 to 2 cases. For decades, the gold standard of anti-thrombotic therapy has been based on heparins and Vitamin K Antagonists (VKAs), their narrow therapeutic range and multiple interactions led to the development of New Oral Anticoagulants (NOACs) beginning in 2003. Two types of new anticoagulants have been developed: Direct factor Xa inhibitors (Rivaroxaban) and direct factor IIa (thrombin) inhibitors.

Aim of Study: The aim of this study was to compare rivaroxaban versus warfarin in treatment of recurrent DVT as regard efficacy, safety and complications.

Patients and Methods: This was a prospective study conducted on 30 patients suffering from recurrent deep venous thrombosis. The studied cases were divided into two groups, Group A treated by rivaroxaban, while group B treated by warfarin over a period of 6 months. All cases were subjected to full history taking, complete general and local examination, routine laboratory investigations and Duplex Scanning.

Results: No statistically significant differences among rivaroxaban and warfarin groups as regards presence of risk factors, DVT extension, duplex results and incidence of complications, while there was significant difference as regards duration till symptoms relief.

Conclusion: Rivaroxaban seems to have same efficacy as warfarin with advantage being earlier in symptoms relief/ days, recanalization and patient compliance. In addition, warfarin users need to be monitored regularly.

Key Words: *Rivaroxaban – Warfarin – Recurrent DVT.*

Introduction

VENOUS Thrombo-Embolism (VTE) manifests as Deep Venous Thrombosis (DVT) and/or Pulmonary Embolism (PE). Per 1000 persons in the general population, the annual incidence is 1 to 2 cases. Complications can occur at all stages of the disease, ranging from recurrent PE or thrombosis to post-thrombotic syndrome and death **[1]**.

For decades, the gold standard of anti-thrombotic therapy has been based on heparins and Vitamin K Antagonists (VKAs) and has successfully reduced the complications mentioned above. However, this therapy has significant disadvantages; the narrow therapeutic range and the need for dosage adjustment with VKAs, interactions with food and concomitant medications, and a complicated and time consuming bridging on attempting invasive interventions **[2]**.

This has led to the development of New Oral Anticoagulants (NOACs) beginning in 2003. Two types of new anticoagulants have been developed: Direct factor Xa inhibitors and direct factor IIa (thrombin) inhibitors **[3]**.

Direct thrombin inhibitors selectively bind to thrombin thereby preventing the sequence of events of the coagulation cascade and the conversion of fibrinogen to fibrin. Direct factor Xa inhibitors block the generation of thrombin from prothrombin without relying on its physiologic inhibitor antithrombin **[4]**.

These factor Xa inhibitors and thrombin inhibitors have dose-proportional pharmacokinetics and their half-life time is similar, ranging from a minimum of 6 to a maximum of 17h **[4]**.

Patients and Methods

Study design: This was a prospective study conducted on 30 patients suffering from recurrent deep venous thrombosis in Damietta Specialized Hospital over a period of 6 months. Patients included in this study were admitted for intervention

Correspondence to: Dr. Mohamed M.R. Yousef, E-Mail: m.m.rshad76@gmail.com

and follow-up at Damietta Specialized Hospital between October 2019 and April 2020.

Patients were divided into two groups: Group A: Treatment started with rivaroxaban at dose of 15mg/12h for 21 days during acute stage. Dose decreased to 10mg/12h as extended therapy. Group B: Treatment started by LMWH (clexane) at dose of 1mg/kg/12h. Marivan tablets started at dose of 10mg at 1st day then 5mg once daily INR monitoring was done at 4th day to adjust dose of marivan until reaching targeted INR (target 2-3 normal ratio) and when so clexane therapy was stopped. Extended therapy with marivan tablets at dose controlled with repeated INR monitoring every 2 weeks. Both groups treated with antiedematous measures (reparil tab/8h), analgesics (cetal tab/8h), elastic stockings and bed rest during acute stage with limb elevation by 20 degree.

Inclusion criteria: Patients with recurrent DVT documented by duplex ultrasound.

Exclusion criteria: Patients with active internal bleeding, recent cerebrovascular accident, recent eye operations and recent central nervous system surgery.

Patient evaluation: All included patients in this study were subjected to the following scheme in a predesigned sheet in order to clinically evaluate the patients and to detect different risk factors of every patient to develop DVT.

Clinical evaluation: Entire cases were subjected to full history taking, complete general and local examinations which include proper inspection of lower limb of edema, tenderness color changes and varicose veins. Besides, routine laboratory investigations [include complete blood count, Blood sugar, renal function tests, liver function tests, bleeding time, clotting time, PT, APPT, prothrombin time and International Normalized Ratio (INR)].

Specific investigations: Duplex scanning: All limbs were subjected to duplex scanning to study: Deep venous system to evaluate patency of the vein, function of the valve and level of the thrombus. Also as a baseline study for further comparisons. Superficial venous system was also evaluated and incompetent perforators was detected.

Follow-up: Early: During the hospital stay until relief of the acute stage of DVT. Late: After discharge from the hospital, in the outpatient clinic.

Statistical analysis:

Data were fed to the computer and analyzed using IBM SPSS Corp. Released 2013. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp. Qualitative data were described using number and percent. Quantitative data were mean, standard deviation for parametric data after testing normality using Shapiro-Wilk test. Significance of the obtained results was judged at the (0.05) level. Chi-Square test, Monte Carlo test & Fischer Exact test were used for comparison as appropriate. Student *t*-test was used to compare 2 independent groups.

Ethical considerations:

The study protocol was approved by the Ethical Committee of Ain-Shams University and a written informed consent was obtained from all patients prior to their participation in the study.

Results

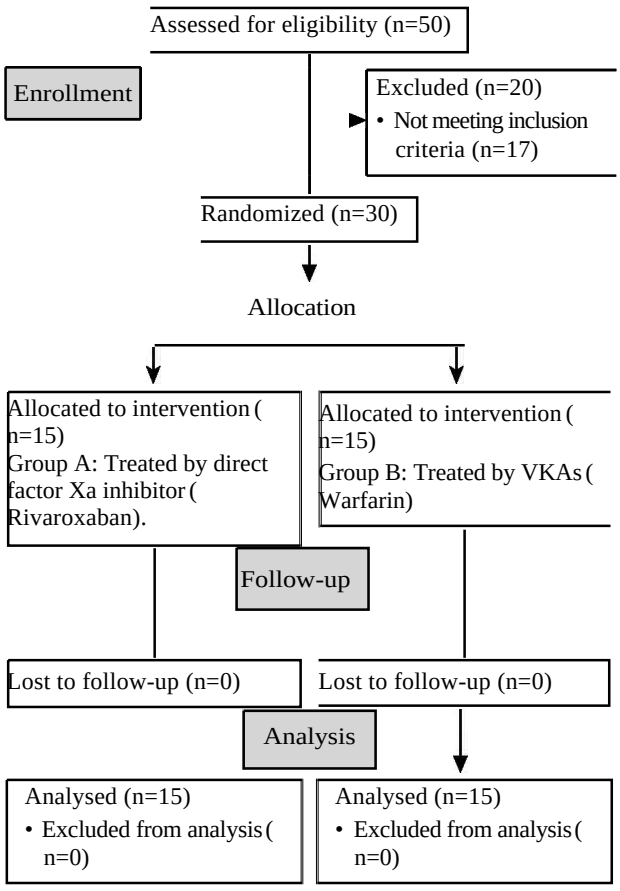

Fig. (1): Consort flow diagram showing study design.

Table (1) illustrates that there is no statistically significant difference between studied groups regarding their age and sex with mean age of the studied groups were 51 & 48.8, respectively for group A & B. Among group A, 46.7% were females versus 40% of group B.

Table (1): Demographic characteristics between studied

	Group A n=15	Group B n=15	Test of significance
Age/years:			*t*=0.442
Mean ± SD	51.0±10.53	48.80±16.15	*p*=0.662
Gender:			
Male	8 (53.3%)	9 (60.0%)	χ^2=0.136
Female	7 (46.7%)	6 (40.0%)	*p*=0.713

t : Student *t*-test.
χ^2: Chi-Square test.

Table (2) & Fig. (2) illustrate that there is no statically significant difference between studied groups regarding symptoms at presentation. Among group B (100% have pain, 33.3% have moderate oedema and 6.7% have mild oedema and Phlegmasia Cerula Dolens while among group A (100% have pain, 33.3% have mild oedema and 6.7% have moderate oedema and Phlegmasia Cerula Dolens).

Table (2): Symptoms among studied groups.

Symptoms	Group A n=15	Group B n=15	Test of significance
Pain	15 (100.0%)	15 (100.0%)	FET *p*=1.0
Oedema:			
Mild	5 (33.3%)	1 (6.7%)	FET *p*
Moderate	1 (6.7%)	5 (33.3%)	=0.08
Phlegmasia Cerula Dolens	1 (6.7%)	1 (6.7%)	FET *p*=1.0

FET: Fischer Exact Test.

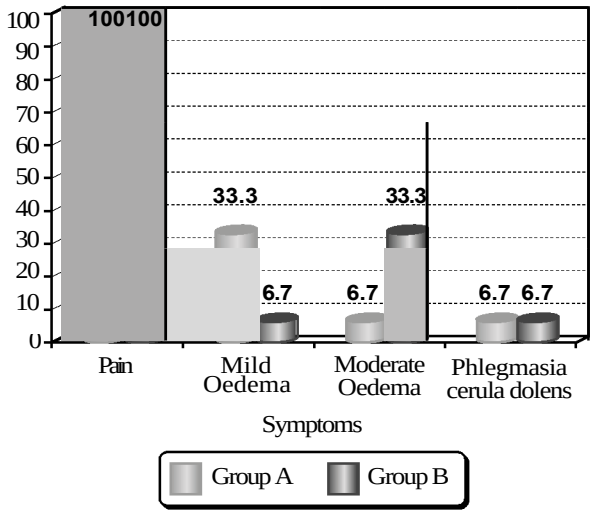

Fig. (2): Distribution of the studied groups according to presenting symptoms.

Table (3) & Fig. (3) illustrate that there is no statistically significant difference between studied groups regarding all studied risk factors with the highest frequency of risk factors was for surgery, smoking history and postpartum, DM, Hypertension and hyperlipidemia).

Table (3): Distribution of the studied groups according to presence of risk factors.

Risk factors	Group A n=15	Group B n=15	Test of significance
Hypothyroidism	1 (6.7%)	0 (0.0%)	FET *p*=1.0
Varicose vein	3 (20.0%)	1 (6.7%)	FET *p*=0.598
Oral contraceptive pills	2 (13.3%)	1 (6.7%)	FET *p*=1.0
Postpartum	0 (0.0)	4 (26.7%)	FET *p*=0.10
Homocysteine positive	1 (6.7%)	0 (0.0%)	FET *p*=1.0
Obesity	0 (0.0%)	1 (6.7%)	FET *p*=1.0
GE	1 (6.7%)	0 (0.0%)	FET *p*=1.0
Trauma	1 (6.7%)	1 (6.7%)	FET *p*=1.0
Orthopedic surgery	1 (6.7%)	4 (26.7%)	FET *p*=0.330
Smoking history	2 (13.3%)	4 (26.7%)	FET *p*=0.651
DM	3 (20.0%)	3 (20.0%)	FET *p*=1.0
Hypertension	3 (20.0%)	1 (6.7%)	FET *p*=0.598
Hyperlipidemia	3 (20.0%)	1 (6.7%)	FET *p*=0.598

FET: Fischer Exact Test.

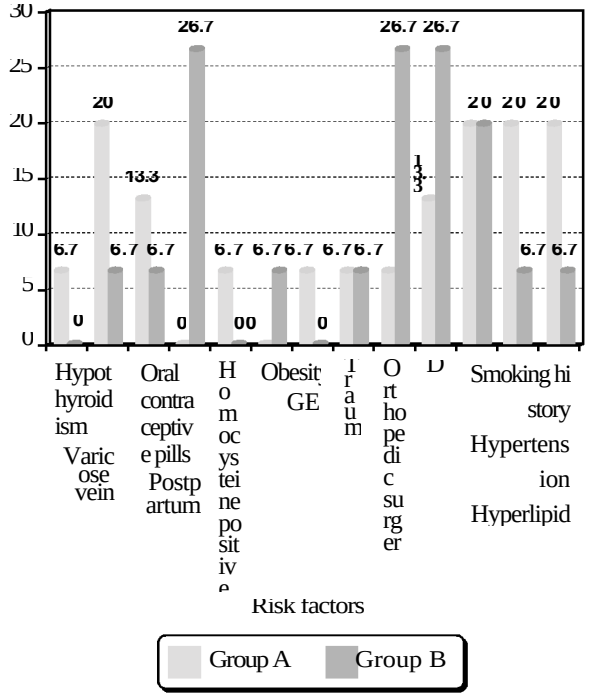

Fig. (3): Distribution of the studied groups according to risk factors.

Table (4): Duration till symptoms relief and INR reached among studied groups.

	Group A n=15	Group B n=15	Test of significance
Symptoms relief/days: Mean ± SD	2.33±1.	3.80±1.	*t*=2.17 *p* =0.038*
INR reached/days:		2.73±1.	

t: Student *t*-test.
*: Statistically significant (if $p<0.05$).

Table (4) & Fig. (4) illustrate that there is statistically significant lower mean duration till symptoms relief among group A as compared to group B (8.8 & 7.33).

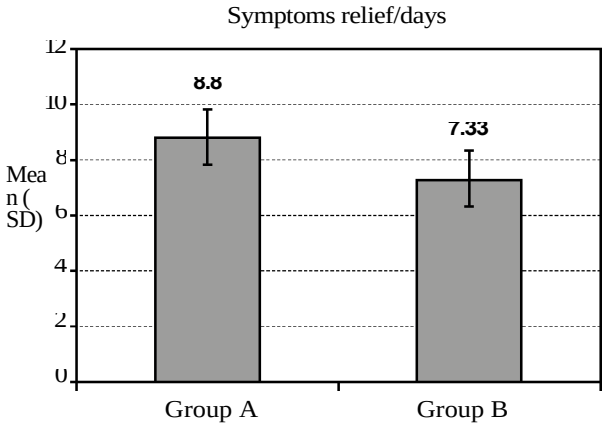

Fig. (4): Distribution of the studied groups according duration till symptoms relief.

Table (5) & Fig. (5) reveal that presence of complications has no-statistically significant difference between studied groups with higher incidence of complications among group A (40.0%) versus 26.7% among group B. Among group A; there was 2 cases with bleeding per gum, while among group B; there was 3 cases, one case marivan toxicity, one case menorrhagia and one case haematuria.

Table (5): Distribution of the studied groups according to incidence of complications.

Complications	Group A n=15	Group B n=15	Test of significance
+ve	6 (40.0%)	4 (26.7%)	X^2=0.60 *p* =0.43
–ve	9 (60.0%)	11 (73.3%)	

X^2: Chi-Square test.

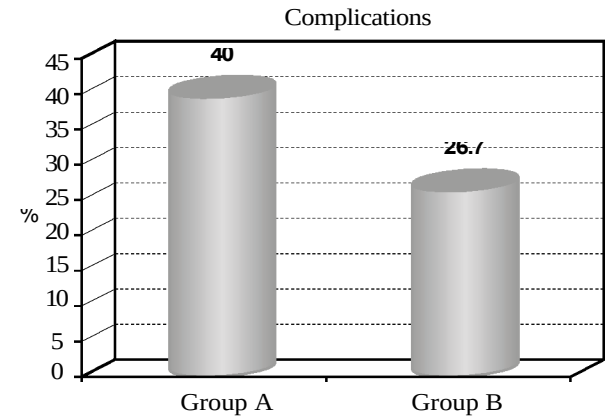

Fig. (5): Incidence of complications among studied groups.

Table (6) there is no statistically significant association between studied risk factors and presence of complications among group A.

Table (6): Association between incidence of complications and presence of risk factors among group A.

Risk factors	Group A n=15		Test of significance
	–ve n=6 (%)	+ve n=9 (%)	
Hypothyroidism	0 (0.0)	1 (16.7)	FET *p*=0.40
Varicose vein	1 (11.1)	2 (33.3)	FET *p*=0.525
Oral contraceptive pills	0 (0.0)	2 (33.3)	FET *p*=0.143
Postpartum	0 (0.0)	0 (0.0)	
Homocysteine positive	1 (11.1)	0 (0.0)	FET *p*=1.0
Obesity	0	0	FET *p*=1.0
GE	1 (11.1)	0 (0.0)	
Trauma	1 (11.1)	0 (0.0)	FET *p*=1.0
Orthopedic surgery	1 (11.1)	0 (0.0)	FET *p*=1.0
Smoking history	2 (22.2)	0 (0.0)	FET *p*=0.343
DM	3 (33.3)	0 (0.0)	FET *p*=0.229
Hypertension	3 (33.3)	0 (0.00	FET *p*=0.229
Hyperlipidemia	2 (22.2)	1 (16.7)	FET *p*=1.0

FET: Fischer Exact Test.

Table (7) shows that, there is no statistically significant association between studied risk factors and presence of complications among group B.

Table (7): Association between incidence of complications and presence of risk factors among group B.

Risk factors	Group B n=15 Complications		Test of significance
	–ve n=11 (%)	+ve n=4 (%)	
Hypothyroidism	0	0	
Varicose vein	0	1 (25.0)	FET *p*=0.267
Oral contraceptive pills	0 (0.0)	1 (25.0)	FET *p*=0.267
Postpartum	4 (36.4)	0 (0.0	FET *p*=0.516
Homocysteine positive	0	0	
Obesity	1 (9.1)	0 (0.0)	FET *p*=1.0
GE	0	0	
Trauma	1 (9.10)	0	FET *p*=1.0
Orthopedic surgery	2 (18.2)	2 (50.0)	FET *p*=0.516
Smoking history	4 (36.40)	0 (0.0)	FET *p*=0.516
DM	3 (27.3)	0 (0.0)	FET *p*=0.516
Hypertension	1 (9.1)	0 (0.0)	FET *p*=1.0
Hyperlipidemia	1 (9.1)	0 (0.0)	FET *p*=1.0

FET: Fischer Exact Test.

Table (8) & Fig. (6) demonstrate that there is no statistically significant difference between studied groups in DVT extension. Extensive DVT was detected among 40% & 46.7% of group A & B, respectively.

Table (8): DVT extension among studied groups.

DVT extension	Group A n=15 (%)	Group B n=15 (%)	Test of significance
Extensive	6 (40.0)	7 (46.7)	MC
Pop	5 (33.3)	5 (33.3)	*p*=0.896
Cuff	4 (26.7)	3 (20.0)	

MC: Monte Carlo test.

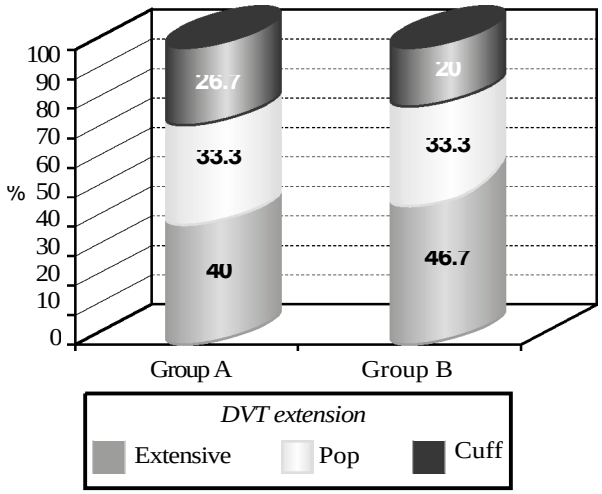

Fig. (6): DVT extension among studied groups.

Table (9) & Fig. (7) reveal that that there is no statistically significant difference between studied groups in duplex results of follow-up with 26.7% of group A have fixed thrombosis versus 20% of group B. Vein fibrosis was detected among 6.7% of group A versus no cases among group B.

Table (9): Duplex results after follow-up among studied groups.

Duplex results after follow-up	Group A n=15 (%)	Group B n=15 (%)	Test of significance
Fixed thrombosis	4 (26.7)	3 (20.0)	MC
Start canalization	7 (46.7)	10 (66.7)	p=0.599
Complete vascularization	3 (20.0)	2 (13.3)	
Vein fibrosis	1 (6.6)	0 (0.0)	

MC: Monte Carlo test.

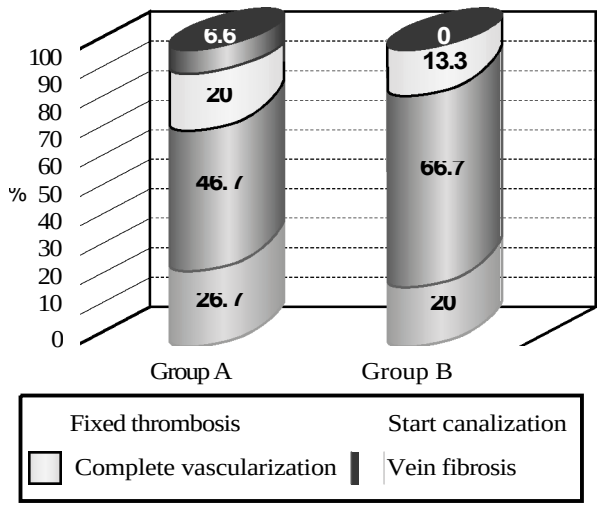

Fig. (7): Duplex results among studied groups.

Discussion

Venous Thromboembolism (VTE), a condition that includes deep venous thrombosis and pulmonary embolism, is common with an annual incidence of approximately one case per 1000 people. As the third most common cause of vascular related death after myocardial infarction and stroke, venous thromboembolism is associated with considerable morbidity and premature mortality **[5]**.

There is considerable debate regarding the ideal agent for VTE prophylaxis. Numerous studies and meta-analyses have yet to provide a clear answer and often omit one or more of the commonly used agents such as aspirin, warfarin, enoxaparin, and factor Xa inhibitors (Rivaroxaban) **[6]**.

Warfarin has been the primary oral anticoagulant used for treatment of venous thromboembolism but has inherent limitations that detract from its therapeutic utility, with a narrow therapeutic index and variability in patients' responses dependent on a range of factors including diet and concomitant drugs. In contrast, Direct Oral Anticoagulants (DOACs) such as Rivaroxaban have relatively stable pharmacokinetics that remove the need for regular monitoring and dose adjustment **[7]**.

Rivaroxaban is a once-daily direct factor Xa inhibitor indicated for the management of VTE. In the EINSTEIN-DVT study, rivaroxaban was as effective and safe as standard therapy for acute treatment of symptomatic DVT **[8,9]**.

To date, no analysis of this subgroup evaluating the efficacy and safety of rivaroxaban compared to warfarin from these trials has been published and a paucity of real-world data evaluating the rivaroxaban versus warfarin therapy in provoked VTE exists.

The aim of the current work was to evaluate the effect of rivatroxaban therapy versus warfarin therapy in cases of recurrent deep vein thrombosis as regard to efficacy, safety as well as complications.

As regards, demographic data, there was no statistically significant difference between studied groups regarding their age and sex, indicating that entire cases were comparable and such factors not interfering with the net results of the current study.

While, Coleman et al., **[10]** demonstrated in their study that, patients who received rivaroxaban tended to be younger and have fewer comorbidities (most notably, hypertension, diabetes, cancer, coagulopathies and chronic kidney disease), following IPTW, patients were deemed well-balanced on all independent variables entered into the propensity-score logistic regression model as demon-

strated by absolute standardised differences between the rivaroxaban and warfarin users <0.1 **[10]**.

As regards, manifestations among the studied cases, there was no statistically significant difference between studied groups regarding symptoms at presentation. Among group B (100% have pain, 33.3% have moderate oedema and 6.7% have mild oedema and Phlegmasia Cerula Dolens while among group A (100% have pain, 33.3% have mild oedema and 6.7% have moderate oedema and Phlegmasia Cerula Dolens).

This indicated that, both groups were comparable in their initial presentation which wouldn't interfere with the net results of the study.

As regards, distribution of the studied groups according to presence of risk factors there is no statistically significant difference between studied groups regarding all studied risk factors with the highest frequency of risk factors was for orthopedic surgery, smoking history and postpartum, DM, Hypertension and hyperlipidemia).

This indicated that, both groups were comparable in their medical conditions and such parameters were not interfering with net results of the study.

This came in agreement with Larsen et al., **[11]** who conducted a study to evaluate the role of rivaroxaban versus warfarin and demonstrated that, both groups were comparable in their medical conditions in terms of DM, HTN, IHD, prior stoke and so on **[11]**.

As regards duration till symptoms relief and INR reached that there is statistically significant lower mean duration till symptoms relief among group A as compared to group B (8.8 & 7.33 **[11]**).

This came in accordance with Roberts et al., **[12]** who revealed that, there was significant lower mean duration till symptoms relief among rivaroxaban group in comparison with warfarin group. The median length of stay in hospital was 4.5 days (interquartile range [IQR], 2.7, 5.9) in the warfarin group and 1.8 days (IQR, 1.2, 3.7) in the rivaroxaban group (p<0.001). In addition, time interval from first dose of oral anticoagulant to discharge was shorter with rivaroxaban (p<0.001) **[12]**.

As regards complications (bleeding), there was higher incidence of complications among group A (40.0%) versus 26.7% among group B buts such increase not reaches the statistical significance. There were 3 cases, one case warfarin toxicity, one case menorrhagia and one case hematuria. There was a case of marivan toxicity readmitted with FFP transfusion and clexane in dose 1mg/kg/12h sc with a reduction in warfarin dose to reach the INR level to 2 and was discharged after 1 week on marivan 5mg/day. In addition, two other cases need only adjustment of marivan dose on outpatient clinic was observed.

This came in accordance with Costa et al., **[13]** who conducted a study on African Americans experiencing an acute VTE during a hospital or Emergency Department visit, who received rivaroxaban or warfarin as their first oral anticoagulant within 7-days of the acute VTE event and had >_1 provider visit in the prior 12-months. They demonstrated that no significant differences in major bleeding among both groups (HR=0.93, 95%CI= 0. 59-1.47) as regarding intracranial hemorrhage, Gastrointestinal bleeding and Genitourinary bleeding **[13]**.

In addition, Larsen et al., **[11]** demonstrated that, the rate of major bleeding was 2.4 per 100 person-years at 6 months in rivaroxaban users versus 2.0 in warfarin users (HR 1.19, 95% CI 0. 66-2.13) **[11]**.

Moreover, several researches reported that rivaroxaban was associated with similar risk of recurrent VTE and bleeding compared with VKA (warfarin) **[14,15]**.

The current study demonstrated that, there was no statistically significant association between studied risk factors and presence of complications in group A and group B separately.

Such results indicated that, risk factors were not interfering with the net results of complications and such complications developed only due to the therapy only.

As regards DVT extension, there was no statistically significant difference between studied groups in DVT extension. Extensive DVT was detected among 40% & 46.7% of group A & B, respectively. As regards recanalization, three cases in Group A and two cases only in Group B was observed indicating the advantage of rivaroxaban over warfarin in such issue.

In the same line, Costa et al., **[13]** revealed that there were no significant differences in the composite endpoint (HR=0.96, 95%CI=0.75-1.24), recurrent VTE (HR=1.02, 95%CI=0.76-1.36) among rivaroxaban and warfarin used group **[13]**.

In addition, in the pooled EINSTEIN trial analysis, rivaroxaban (n=4151) was found to be non-

inferior to enoxaparin/warfarin (VKA) (n=4131) for the endpoint of recurrent VTE with a 2.1 and 2. 3% incidence, respectively (HR=0.89; 95%CI= 0. 66-1.19). These results were echoed in XALIA which found no significant difference in recurrent VTE risk between rivaroxaban (n=2619) (1.4%) and warfarin (n=2149) (2.3%) of acute DVT (± PE) in routine practice (propensity score-adjusted HR=0.91; 95%CI=0.54-1.54) **[13]**.

While, Coleman et al., **[10]** included 4454 rivaroxaban and 13,164 warfarin users with provoked VTE. At 3 and 6months, rivaroxaban was associated with a reduced hazard of the composite endpoint (HR 0.72, 95% CI 0.61-0.84 and HR 0.69, 95% CI 0.60-0.80) and recurrent VTE (HR 0.70, 95% CI 0.59-0.84 and HR 0.71, 95% CI 0.60-0.84) versus warfarin. They suggested that rivaroxaban is associated with a reduced risk of recurrent VTE and bleeding compared to warfarin/standard anticoagulation among a mixed population of both unprovoked and provoked VTE, but none of these studies reported results stratified by presence of a provoking risk factor for VTE **[10]**.

An additional retrospective analysis performed in the Danish nationwide databases limited to patients with incident unprovoked VTE only found rivaroxaban to be associated with a reduction in recurrent VTE (HR 0.69, 95% CI 0.55-0.87) versus warfarin without a significant difference in major bleeding risk (HR 1. 18, 95% CI 0.69-2.04) **[11]**.

The present study demonstrated that, there was no statistically significant difference between studied groups in duplex results of follow-up with 26.7% of group A have fixed thrombosis versus 20% of group B. Vein fibrosis was detected among 6. 7% of group A versus no cases among group B with no statistically significant difference among both groups.

In the same line, A 2015 Cochrane meta-analysis of 11 RCTs (N=27,945) compared direct thrombin inhibitors, factor Xa inhibitors (rivaroxaban, apixaban [Eliquis], and edoxaban [Savaysa]), and standard anticoagulants (unfractionated heparin, low-molecular-weight heparin, and vitamin K antagonists such as warfarin) in the treatment of venous thromboembolism (VTE). Eight of the RCTs (N= 16,356) compared factor Xa inhibitors with standard anticoagulants; four (N=9,428) compared rivaroxaban with standard anticoagulants (international normalized ratio goal of 2 to 3). Primary outcomes included recurrent VTE and recurrent DVT. After three months, there was a significant trend in favour of factor Xa inhibitors compared with warfarin for the prevention of recurrent VTE (five trials, three with rivaroxaban; N=5,001; Odds Ratio [OR]=0.69; 95% Confidence Interval [CI], 0.48 to 0.99) and recurrent DVT (four trials, two with rivaroxaban; N=4,917; OR=0.51; 95% CI, 0. 31 to 0.84 **[16]**.

When treatment was extended beyond three months, there were no significant differences in rates of recurrent VTE (three trials, one with rivaroxaban; N=11,355; OR=0.97; 95% CI, 0.78 to 1. 22) or recurrent DVT (three trials, one with rivaroxaban; N=11,355; OR=0.87; 95% CI, 0.63 to 1.20) compared with warfarin. Overall, there was a significant decrease in rates of recurrent VTE with factor Xa inhibitors compared with standard anticoagulants at three months (eight trials; N=16,356; OR=0.69; 95% CI, 0.48 to 0.99), but not when treatment was extended beyond three months (OR=0.97; 95% CI, 0.78 to 1.22). Rates of fatal and nonfatal PE were similar between factor Xa inhibitors and warfarin; no studies comparing rivaroxaban with warfarin for the primary outcome of PE prevention lasted more than three months **[16]**.

On the other hand, De Athayde et al., **[17]** demonstrated that the incidence of postthrombotic syndrome was 17.9% (15 cases) in the total cohort, but was significantly higher in group 2 (warfarin) (11 cases, 28.9%) than in group 1 (rivaroxaban) (4 cases, 8.7%; $p<.001$; odds ratio, 4.278). The rate of total venous recanalization at 360 days was 40.5% (34 patients) in the total cohort, but was significantly higher in group 1 (35 patients, 76.1%) than in group 2 (5 patients, 13.2%; $p<.001$). The incidence of partial venous recanalization was 46.4% and was significantly higher in group 2 (28 patients, 73.7%) than in group 1 (11 patients, 23.9%; $p=.016$). Five patients in the total cohort (6%) showed no venous recanalization, all of them in group 2 ($p=.016$). Thus, they concluded that, patients who received oral rivaroxaban displayed a lower incidence of postthrombotic syndrome and a better total vein recanalization rate after 6 and 12 months than patients who received warfarin **[17]**.

In addition, Coleman et al., **[18]** demonstrated that rivaroxaban was associated with a significant risk reduction in symptoms of postthrombotic syndrome compared to warfarin in patients with VTE treated in routine practice **[18]**.

Such discrepancies among the current study and De Athayde et al., **[17]** and Coleman et al., **[18]** researches may be due to usage of small sample

size in the current study, short period of follow-up and non-continuous maintenance on therapy due to low socioeconomic and low educational level among the Egyptian patients. Therefore, further studies have to conduct in the future on large group of people with strict follow-up **[17,18]**.

Conclusion:

Rivaroxaban seems to have same efficacy as warfarin with advantage being earlier in symptoms relief/days, recanalization and patient compliance. In addition, warfarin users need to be monitored regularly.

References

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دراسة مقارنة بين عقار الريفاروكسابان وعقار الوارفارين فى علاج تجلط الآوردة العميقة المتكرر

تضمن الجلطات الدموية الوريدية، والتى تشمل الجلطات الوريدية العميقة والإنسداد الرئوى إرتفاع فى معدل الوفيات والمرضى والتكاليف. خلال العقود السابقة، كان العلاج الآساسى لهذه الحالة هو مضادات التخثر والتى تشمل الهيبارين ومضادات فيتامين ك، ومع ذلك، فإن هذا العلاج له نطاق علاجى ضيق ويتطلب التعديل المناسب للجرعة. وقد آدى ذلك إلى تطوير مضادات التخثر الفموية الجديدة (NOACs) التى لها نوعان: مثبطات العامل Xa المباشر ومثبطات العامل IIa (الثرومبين) المباشر.

الهدف من العمل: تهدف الدراسة الحالية إلى مقارنة الريفاروكسابان وعقار الوارفارين فى علاج تجلط الآوردة العميقة المتكرر فيما يتعلق بالفعالية والآمان والمضاعفات.

تصميم الدراسة: آجريت الدراسة الحالية على ثلاثين مريضاً يعانون من تجلط وريدى عميق متكرر فى مستشفى دمياط التخصصى على مدى ٦ آشهر. تم حجز المرضى فى هذه الدراسة للتدخل والمتابعة فى الفترة الزمنية بين آكتوبر ٢٠١٩ وآبريل ٢٠٢٠.

كشفت الدراسة الحالية عن النتائج التالية:

كان هناك تحسن سريع للآعراض وسرعه ذوبان الجلطة الوريدية فى مجموعة الريفاروكسابان مقارنة بنظيرتها من مجموعة الوارفارين.

عقار الوارفارين يحتاج إلى متابعة دورية مستمرة كونه له نطاق علاجى ضيق وتفاعلات دوائية كثيره.

الإستنتاج: من خلال هذه الدراسة تبين آن عقار الريفاروكسابان له نفس كفاءه عقار الوارفارين مع التحسن السريع للآعراض وذوبان الجلطة الوريدية ونطاق علاجى آفضل من عقار الوارفارين.