



Prevalence of Antiphospholipid Antibodies in Patients with Venous Thromboembolism at Chonburi Hospital

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Abstract:

Background: Venous thromboembolism (VTE) is a common condition in clinical practice. Antiphospholipid antibodies (APAs) have been investigated for the causes of thrombosis, which affect anticoagulant duration. The prevalence and association between VTE and APAs influenced the decision to investigate.

Objective: To investigate the prevalence and association between venous thromboembolism (VTE) and antiphospholipid antibodies (APAs).

Materials and Method: A retrospective cross-sectional study was conducted to analyze the medical records of patients with VTE at Chonburi Hospital from January 1, 2021, to April 30, 2024. The data collected included age, sex, body mass index (BMI), location of thrombosis, pregnancy status, underlying diseases, episodes of thrombosis, and presence of APAs. The binary logistic regression analysis focused on the prevalence and risk factors associated with APAs.

Results: In a study of 189 patients with VTE, 42 (22.2%) tested positive for APAs. The average age of the patients was 46 years, and 54.8% were female. Multivariate analysis showed that antiphospholipid antibody-positive patients had a significant association with unprovoked thrombosis, with an adjusted odds ratio of 4.01 (p-value 0.03).

Conclusion: The prevalence of APAs in patients with VTE at Chonburi Hospital was 22.2%. The presence of APAs was significantly associated with unprovoked thrombosis. However, further studies are required to better understand this association.

Keywords: Antiphospholipid antibodies, Prevalence, Venous thromboembolism, Risk association

Introduction

Venous thromboembolism is common in general practice, with the usual sites of thrombosis being pulmonary embolism (PE) and deep vein thrombosis (DVT). Unusual sites include the cerebral venous sinus, splanchnic vein, renal vein, and other site. Thrombophilia, an increased risk of blood clots, is categorized into inherited and acquired types. Identifying the causes of thrombophilia is crucial, as it determines the length of anticoagulant treatment needed.¹

APAs include lupus anticoagulant, anti-beta2 glycoprotein IgM, IgG and anticardiolipin IgM, IgG. Their association with VTE varies, with common risk factors like systemic lupus erythematosus (SLE) and unusual site thrombosis.^{1,2} The prevalence of antiphospholipid antibodies in patients with thrombosis ranges from 14% to 46%.^{3,5,9,14} The risk factors associated with antiphospholipid antibodies positive thrombosis in previous studies include unprovoked DVT, recurrent thrombosis, autoimmune diseases, unusual site thrombosis, and extended thrombosis.^{4,5,6,16} The Prevalence and association of VTE and APAs guides our decision to investigate patients, allowing us to focus on those who truly need it and save on cost.

Study design

A retrospective cross-sectional study was conducted to review the medical records of patients with VTE at Chonburi Hospital from 1 January 2021 to 30 April 2024.

Inclusion and Exclusion Criteria

The inclusion criteria comprised patients over 18 years old who were diagnosed with VTE confirmed by imaging. We excluded patients who were superficial thrombosis and inherited thrombophilia. This study was approved by the Research Ethic Committee of Chonburi Hospital.

Materials and method

We collected medical record 189 patients with VTE, using the 10th revision of the International Classification of Diseases (ICD-10) codes I260, I269, I636, I801, I802, I809, I81, I820, I822, I823, I828, I829. The data collected included age, sex, BMI, thrombosis location, pregnancy status, underlying diseases, episodes of thrombosis, and the presence of APAs.

APAs included lupus anticoagulant, Anticardiolipin IgM, IgG and Anti-beta2 glycoprotein IgM, IgG. We gathered data for our investigation by Lupus anticoagulant positivity interpreted according to ISTH guidelines¹⁰ and the timing of the investigation collected before anticoagulant treatment or after withholding anticoagulants for 5-7 days. If reported inconclusive defined to negative.

Anti-beta2 glycoprotein IgM, IgG and Anticardiolipin IgM, IgG defined as positive in a laboratory report, the timing of the investigation collected anytime when diagnosed VTE

Primary and secondary outcome

The primary outcome was the prevalence of APAs in VTE patients at Chonburi Hospital. The secondary outcome was the association of VTE and APAs.

Statistical analysis

Descriptive statistics summarize qualitative variables, like gender, as frequencies or percentages. For quantitative variables, such as age, the mean and standard deviation were used. For comparison of demographic data analysis, use chi-square or Fisher's exact test for categorical data, and apply the independent t-test or Mann-Whitney U test for continuous data as appropriate. Binary logistic regression analysis was performed for related factors in patients with VTE who tested positive

for APAs. P -value < 0.05 was considered statistically significant.

Results

This study included 189 patients with VTE confirmed by imaging. The cohort had a mean age of 48.14 years, with females constituting 67.7% of participants and a mean BMI of 25.23 kg/m². Most patients

experienced their first thrombotic event. Deep vein thrombosis (DVT) was the most common presentation (42.3%), followed by pulmonary embolism (PE) (33.3%) and cavernous sinus thrombosis (13.2%). Antiphospholipid antibodies (APAs) were detected in 42 patients, representing a prevalence of 22.2% among the study population.

Table 1 Patients characteristics

characteristic	All n = 189	APAs positive n = 42	APAs negative n = 147	<i>p</i> -value
Age, years, mean \pm SD	48.2 \pm 16.5	46.4 \pm 16.8	48.6 \pm 6.4	0.75 ^a
Sex, n (%)				
Female	128 (67.7)	23 (54.8)	105 (71.4)	0.04 ^b
BMI (Kg/m²), mean \pm SD	25.3 \pm 5.6	24.1 \pm 4.5	25.6 \pm 5.9	0.23 ^a
Pregnancy, n (%)	4 (2.1)	3 (7.1)	1 (0.7)	0.03 ^c
Location of thrombosis, n (%)				
Pulmonary embolism	63 (33.3)	10 (23.8)	53 (36.1)	0.14 ^b
Deep vein thrombosis	80 (42.3)	19 (45.2)	61 (41.5)	0.67 ^b
Splanchnic vein thrombosis	15 (7.9)	4 (9.5)	11 (7.5)	0.75 ^c
Cavernous sinus thrombosis	25 (13.2)	7 (16.5)	18 (12.2)	0.46 ^b
Renal vein thrombosis	1 (0.5)	0 (0)	1 (0.7)	1.00 ^c
Others	5 (2.6)	2 (4.8)	2 (1.4)	0.18 ^b
Underlying disease, n (%)				
SLE	17 (7)	6 (14.3)	11 (7.5)	0.22 ^c
Cancer	18 (9.5)	5 (11.9)	13 (8.8)	0.56 ^c
Recurrent thrombosis, n (%)	29 (15.3)	7 (16.7)	22 (15)	0.79 ^b
Unprovoked thrombosis, n (%)	146 (77.2)	39 (92.9)	107 (72.8)	0.01 ^b

Data was presented as n (%), mean (SD). A p -value < 0.05 indicated statistically significant; ^aUnpaired t-test (equal variate was assumed); ^bchi-square test; ^cFisher's exact test; *analyse without missing data.

Abbreviation: APAs, antiphospholipid antibodies; SD, standard deviation; BMI, body mass index; SLE, systemic lupus erythematosus

Univariate analysis of the association between APAs-positive and VTE patients indicated that the factors associated with positive APAs included female sex [OR = 2.06 (95% CI 0.45, 2.88), $p = 0.04$] and unprovoked thrombosis [OR = 4.86 (95% CI 0.72, 3.31), $p = 0.01$]. When the

two factors were analyzed using multivariate analysis, only unprovoked thrombosis [adjusted OR = 4.01 (95% CI 1.16, 14.16), p -value = 0.03] demonstrated a significant association with the detection of these antibodies, whereas female did not exhibit statistical significance.

Table 2 The related factor of a positive APAs in VTE patients at Chonburi Hospital

Factor	Univariable			Multivariable		
	OR	95% CI	p-value	OR*	95% CI	p-value**
SLE	2.06	0.71-5.9	0.18			
Unprovoked thrombosis	4.86	1.42-16.6	0.01	4.01	1.16-14.16	0.03
Unusual site	1.55	0.72-3.31	0.26			
Recurrent thrombosis	1.14	0.45-2.88	0.79			
Female	2.06	1.02-4.18	0.04	2.08	0.95-4.52	0.06
Age < 50 years old	1.38	0.68-2.82	0.36			

OR*, an adjusted odds ratio

p -value < 0.05 indicated statistical significance by Binary Logistic regression

Abbreviation: OR, Odds ratio; CI, Confident interval; SLE, systemic lupus erythematosus

Discussion

The prevalence of APAs (22.2%) in our cohort of patients with VTE at Chonburi Hospital fell within the range reported in previous studies^{3,5,9} that APAs were positive in venous thromboembolism patients at 14%, 15%, and 21.7%, respectively

Our study identified that unprovoked thrombosis increased the likelihood of detecting APAs in patients with VTE by fourfold (p -value < 0.05). This finding is consistent with previous study, which recognized unprovoked DVT and recurrent DVT as risk factors. However, it is noteworthy that research was limited to deep vein thrombosis and did not include other thrombosis location.⁴ A study reported a 14% positivity rate for APAs in cases of unprovoked thrombosis⁷, which aligns with our findings.

Previous studies have identified systemic lupus erythematosus (SLE), female gender, recurrent thrombosis, and thrombosis at unusual sites as risk factors for APAs positivity.^{4-6,16} However our study did not find these factors to be significant. We observed that thrombosis in cancer patients was not associated with APAs. Conversely, previous study reported a 60.6% prevalence of APAs linked to recurrent thrombosis.⁶

The limitations of this study include its retrospective design, incomplete data, and missing laboratory investigations, which may have affected the accuracy of the results. Future research should involve a prospective cohort study to ensure comprehensive data collection, potentially incorporating additional factors, such as drug use and other underlying diseases, to better understand the association of factors.

Conclusion

The prevalence of APAs in patients with VTE at Chonburi Hospital was 22.2%. The presence of APAs was significantly associated with unprovoked thrombosis [adjusted OR = 4.01 (95% CI 1.16, 14.16), *p*-value = 0.03]. However, further studies are needed to better understand this association.

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