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DIAGNOSTIC SPECIFICITIES IN WOMEN WITH ANTIPHOSPHOLIPID SYNDROME

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Abstract: Antiphospholipid syndrome (APS) is one of the leading immuno-thrombotic causes of recurrent pregnancy loss and pregnancy failure in women of reproductive age. APS is characterized by hypercoagulation, endothelial dysfunction, and disturbances in the fetoplacental system resulting from the production of antiphospholipid antibodies. This article presents a comprehensive analysis of the clinical, laboratory, and instrumental diagnostic criteria of APS, emphasizing the diagnostic value of D-dimer, β2-glycoprotein I antibodies, lupus anticoagulant, and Doppler indices. The findings demonstrate that early and integrated screening significantly improves reproductive outcomes and reduces pregnancy loss.

Keywords: antiphospholipid syndrome, recurrent pregnancy loss, β2-glycoprotein I, D-dimer, hemostasis, Doppler ultrasound, fetoplacental system.

Introduction

Pregnancy failure remains a major obstetric challenge worldwide. The prevalence of miscarriage ranges from 7–10% in developed countries to 15–20% in developing regions. In cases of recurrent pregnancy loss (two or more consecutive miscarriages), antiphospholipid syndrome is identified in approximately 30–40% of women

APS is an autoimmune thrombotic disorder characterized by the persistent presence of antiphospholipid antibodies (aPL), leading to pathological activation of the coagulation cascade. Clinically, APS manifests as:

- Recurrent early miscarriages
- Fetal death after 10 weeks of gestation
- Severe preeclampsia
- Placental insufficiency
- Arterial and venous thrombosis
- Thrombocytopenia

Untreated APS is associated with extremely poor reproductive outcomes, with live birth rates reported as low as 8–10%. However, appropriate anticoagulant therapy increases live birth rates to 70–85% .

Materials and Methods

The study analyzed 105 women divided into three groups :

Group	Description	Number
I	Physiological pregnancy	35

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II	APS without preconception therapy	35
III	APS with preconception therapy	35

The following investigations were performed:

- Antiphospholipid antibodies (IgG, IgM)
- Anti-β2-glycoprotein I antibodies
- Lupus anticoagulant (LA)
- Activated partial thromboplastin time (aPTT)
- Prothrombin index (PTI)
- Fibrinogen
- D-dimer
- Ultrasound and Doppler velocimetry
- Statistical correlation analysis

Results and Discussion

1. *Clinical Diagnostic Challenges in APS*

One of the main diagnostic challenges of APS lies in the nonspecific nature of its clinical presentation. Thrombotic episodes may be absent, and pregnancy complications may represent the first manifestation.

APS should be suspected in women with:

- Two or more consecutive early miscarriages
- One or more unexplained fetal deaths after 10 weeks
- Severe preeclampsia before 34 weeks
- Unexplained arterial or venous thrombosis

The diagnosis requires at least one clinical criterion and one laboratory criterion confirmed on two separate occasions.

2. Laboratory Diagnostic Specificities

2.1 *Antiphospholipid Antibodies*

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The principal laboratory markers include:

- Anticardiolipin antibodies
- Anti-β2-glycoprotein I antibodies
- Lupus anticoagulant

β2-glycoprotein I is a plasma protein composed of 392 amino acids and plays a central role in APS pathogenesis. IgG class antibodies are particularly pathogenic, as they can cross the placental barrier after 15 weeks of gestation and directly affect fetal circulation.

2.2 *Diagnostic Value of D-Dimer*

D-dimer, a fibrin degradation product, is considered one of the most reliable markers of hypercoagulation.

Levels >500 ng/mL indicate increased thrombotic risk

Elevated levels in early pregnancy suggest pathological activation of coagulation

APS patients demonstrate significantly higher D-dimer concentrations compared to controls

Hypercoagulation is frequently observed already in the first trimester among APS patients .

3. Hemostatic Alterations in APS

APS is characterized by:

- Increased platelet aggregation
- Shortened aPTT in later trimesters
- Elevated fibrinogen
- Increased soluble fibrin monomer complexes
- Elevated D-dimer levels
- Microthrombi formation
- These changes lead to:
- Placental infarction
- Villous ischemia
- Impaired uteroplacental blood flow
- Fetal hypoxia
- Intrauterine growth restriction

The disruption of the fetoplacental circulation plays a central role in adverse pregnancy outcomes .

4. Role of Doppler Ultrasound in Early Diagnosis

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Doppler velocimetry reveals significant hemodynamic disturbances in APS patients:

Increased resistance index (RI)

Elevated systolic/diastolic ratio (S/D)

Reduced uterine artery perfusion

An increase in RI exceeding 10% and elevated S/D ratio are considered early markers of placental dysfunction.

Doppler assessment enables detection of fetoplacental insufficiency before clinical symptoms develop .

Diagnostic Algorithm in APS

Stage I – Clinical Assessment

- Recurrent miscarriage
- History of thrombosis
- Severe preeclampsia

Stage II – Laboratory Screening

- Antiphospholipid antibodies
- Anti-β2-glycoprotein I
- Lupus anticoagulant
- D-dimer
- Coagulation profile

Stage III – Instrumental Evaluation

- Ultrasound
- Doppler velocimetry

Stage IV – Preconception Screening

- Risk stratification before pregnancy
- Prophylactic anticoagulant therapy

Clinical Significance

Integrated diagnostic assessment allows:

- Early identification of high-risk patients
- Reduction in recurrent pregnancy loss
- Decreased incidence of preeclampsia
- Increased live birth rates up to 70–85%

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Conclusion

Diagnostic evaluation of women with antiphospholipid syndrome possesses several specific characteristics:

1. Nonspecific clinical presentation
2. Critical role of laboratory biomarkers
3. Prognostic significance of D-dimer
4. Early detection of fetoplacental dysfunction via Doppler
5. Importance of preconception screening

Early recognition and comprehensive assessment of APS significantly improve pregnancy outcomes and reduce reproductive losses.

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