

## **Evaluation the levels of thyroid hormones in pregnant women with phospholipid syndrome**

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### **Abstract**

Miscarriage in the early and late stages of pregnancy is a common problem in women with the anti-phospholipids syndrome. The current study aimed to determine the relationship between the syndrome of antibodies to phospholipid and thyroid hormones among pregnant women in the city of Nasiriyah. Blood samples were collected from (100) pregnant women with recurrent miscarriages due to phospholipid syndrome, the average aged (20-30) and (30-40) years. The results showed a significant increase in T3 and TSH hormones between ages (20-30), (30-40) years compared to the control group, as well as a significant increase in T4 hormone in pregnant women aged (20-30) while the ages group of (30-40) did not notice a significant change in the level of hormone T4 compared with the control group. We conclude that there is a relationship between thyroid hormones and autoimmune diseases.

**Keywords:** anti phospholipids syndrome, miscarriage, Thyroid hormones.

**تقييم مستويات هرمونات الغدة الدرقية في النساء الحوامل التي تعاني من**

**متلازمة الفوسفوليبيد**

**شيماء زغير الرميض**

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### **الخلاصة**

الإجهاض المتكرر في المراحل المبكرة والمتأخرة من الحمل هو مشكلة شائعة لدى النساء المصابات بمتلازمة الأجسام المضادة للفوسفوليبيد, هدفت الدراسة الحالية إلى تحديد العلاقة بين متلازمة الأجسام المضادة للفوسفوليبيد وبين هرمونات الغدة الدرقية بين النساء الحوامل في مدينة الناصرية. جمعت عينات الدم من ( 100 ) امرأة حامل تعاني من حالة الإجهاض المتكرر نتيجة

الإصابة بمتلازمة الفوسفوليبيد والتي تتراوح أعمارهن بين (20-30) و (30-40) سنة , أظهرت النتائج زيادة معنوية في هرمونات T3 ، TSH في الأعمار بين (20-30) و (30-40) سنة مقارنة مع المجموعة السيطرة , كذلك زيادة معنوية في هرمون T4 لدى النساء الحوامل تتراوح أعمارهن (20-30) بينما الأعمار بين (30-40) لم يلاحظ فيها تغير معنوي في مستوى هرمون T4 مقارنة مع مجموعة السيطرة .وبذلك نستنتج أن هناك علاقة بين هرمونات الغدة الدرقية والأمراض ذاتية المناعة .

**الكلمات المفتاحية :** متلازمة الفوسفوليبيد ، الإجهاض ، هرمونات الغدة الدرقية .

## Introduction

Pregnancy loss has been attributed to several factors involved in human reproduction, anatomic features, genetic, , hyperthyroidism, infections, diabetes, systemic hypertension (endocrine), environmental pollutants, psychogenetic and Immunological factors which are remarkable causes of abortion. also, elevation of the antiphospholipid antibody plasma level was important one of these factors (Souza *et al.*, 2003) these antibodies include antiphosphatidylglycerol , anticardiolipin , anti-beta2-glycoprotein , lupus anticoagulant , antiphosphoserine , anti-phosphatidyl inositol and anti-phosphatidic acid (Levine *et al.*, 2002), but more critical and more important roles in spontaneous abortion are lupus anticoagulant and anticardiolipin (Vinatier *et al.*, 2001). Antiphospholipid syndrome (APS) is an acquired autoimmune disorder that manifests clinically as recurrent venous or arterial thrombosis and/or fetal loss ( Negrini ,2016). APS is characterized by the presence of antiphospholipid antibodies (aPL) and has long been associated with Recurrent pregnancy loss (RPL). Indeed, pregnancy morbidity is one of the two clinical criteria required to confirm the diagnosis of APS, the other being vascular thrombosis (Miyakis *et al.*, 2006). The prevalence of APS in women with recurrent pregnancy loss (RPL) varies according to studies, from as low as 6% to as high as 42%, but it is generally accepted to be 5%–20% (Opartrny *et al.*,2006), (Andreoli *et al.* ,2013).aPL target the trophoblast, causing an impaired trophoblastic invasion and inappropriate secretion of human chorionic gonadotropin and growth factor (Di Simone *et al.*, 2000) as well as inducing syncytiotrophoblast apoptosis (Di Simone *et al.*,2001) and an inflammatory response via complement activation at the maternal–fetal

interface.( Meroni *et al.*,2011). They also target the vascular endothelium and cause abnormal formation of the spiral arteries. (Di Simone *et al* .,2001) Clinical presentation of APS includes manifestations of various organs and systems, such as blood vessels, central nervous system , skin, kidney, gastrointestinal tract, heart, and placenta. The hallmark of the syndrome is thrombosis, either arterial or venous. thrombosis in APS may occur in any vascular bed( Rai *et al* .,2010).

Thyroid gland is one of the largest glands with a shape like the butterfly are located in the lower part of the neck wrapped around the front of the trachea (Mader and Sylria,2001).Thyroid gland produces thyroid hormones triiodothyronine (T3), thyroxine (T4) by thyroid follicular cells and calcitonin by C cells(Vander, Sherman & Luciano, 2001).Thyroid dysfunctions such as hypothyroidism, thyrotoxicosis and thyroid nodules may develop during pregnancy leading to abortion, placental abruptions, preeclampsia, preterm delivery and reduced intellectual function in the offspring( Aynadis *et al.*, 2016).Thyroid hormones are very important for growth and development of brain for the fetus and neonate, in addition for many other aspects of pregnancy, fetal growth and development (De Escobar *et al* ., 2004). The thyroid gland dysfunctions like hypothyroidism and thyrotoxicosis can affect the mother health as well as the child before and after delivery that can result in fetal disease; in humans, this includes a high incidence of mental retardation (Kilby ,2003)

## **Material and methods**

### **subject**

women with recurrent spontaneous abortions positive for primary antiphospholipid antibody (age range: 20 – 40 years) were investigated,. The patients women with a history of three or more pregnancy loss, and this loss occur in first and/or second trimester pregnancy loss (< 22 week of gestation). A control sample of 40 fertile women with no previous fetal loss.

## **Materials**

VIDAS T3,T4, TSH is an automated quantitative test for use on the VIDAS family instruments for the determination of thyroid hormone in human serum or plasma (Biomerieux ,France).

## **Collection of Blood Samples**

From each subject, 5 ml of blood were obtained by vein puncture The blood sample was dispensed in a plain tube, and left for 15 minutes at 4°C to clot. Then, it was centrifuged at 3000 rpm for 10 minutes to collect serum. The serum was divided into aliquots (0.5 ml), and stored in the deep freezer (-20°C) until use.

## **Statistical Analysis**

The data of other parameters were tabulated in a data sheet, and the data were analyzed using the computer programme SPSS (Statistical Package for Social Sciences) version ( 14.0, 17.0). The investigated parameters were presented in terms of means  $\pm$  standard errors (S.E.), and differences between means of patients and controls were assessed by ANOVA test and the Least Significant Difference (LSD). The difference was considered significant when the probability (P) value were ( $\leq 0.05$ ,  $\leq 0.01$ ).

## **Results**

### **Serum Levels of Thyroxin gland Hormones**

#### **1 Tri-iodothyronine (T3)**

in patients showed a significant ( $p \leq 0.05$ ) increased mean level of T3 as compared to the groups control. The significant increase was observed in the age group 20-30 years and 30-40 years (.22 vs. 1.67, and 2.10 vs. 1.60 respectively), compared to controls ,(Table 1).

Table (1): Serum level (mean  $\pm$  S.E.) of T3 in APA patients and controls divided by age.

Age Groups (years)	No.	T3 Mean Serum Level $\pm$ S.E. (m UI/ ml)		LSD
		Control	Patient	
20-30	20	1.67 $\pm$ 0.06	2.22 $\pm$ 0.15*	0.32

30-40	20	1.60±0.09	2.10±0.12 *	0.30
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(\*) indicates a significant difference between groups,  $P \leq 0.05$

## 2. Thyroxin (T4)

In the patients group (20-30) years, the T4 level showed the highest mean (111.86 vs. 93.29) , but showed non a significant(108.28 vs. 96.66) in group (30-40) as compared to the control (Table 2 ).

Table( 2): Serum level (mean  $\pm$  S.E.) of T4 in APA patients and controls divided by age.

Age Groups (years)	NO	T4 Mean Serum Level $\pm$ S.E.(m UI/ml)		LSD
		Control	Patient	
20-30	20	93.29±1.98	111.86±4.19 *	9.27
30-40	20	96.66±3.25	108.28±6.80	15.42

(\*) indicates a significant difference between groups,  $P \leq 0.05$

## 3. Thyroid Stimulating hormone (TSH)

In the patients showed a significant ( $p \leq 0.05$ ) increased mean level of TSH as compared to the controls. The significant increase was observed in the age group 20-30 years and 3 0-40 years (2.33 vs. 1.79 and 2.03 vs. 1.59, respectively), compared to controls (Table 3).

Table(3): Serum level (mean  $\pm$  S.E.) of TSH in APA patients and controls divided by age .

Age Groups (years)	TSH Mean Serum Level $\pm$ S.E. (m UI/ml)		LSD
	Control	Patient	
20-29	1.79±0.29	2.33±0.19 *	0.44
30-39	1.59±0.35	2.03±0.29 *	0.79

(\*) indicates a significant difference between groups,  $P \leq 0.05$

## Discussion

In this study, the level of thyroid hormone showed a significant increase in antiphospholipid antibodies patients as compared with controls. Similar results for this study was showed by (Debanjali , 2012).

The thyroid gland and gonadal axes interact continuously before and during pregnancy, thyroid autoimmunity are prevalent among women at reproductive age and are associated with adverse pregnancy outcomes (Kennedy *et al.*, 2010).

The higher prevalence of thyroid identified in euthyroid women with recurrent miscarriage has led to the assumption that these antibodies are linked to the women's experience and will predicate an increased risk of future miscarriage for them. It has been suggested that, in women with recurrent miscarriage, thyroid antibodies are a consequence not of thyroid dysfunction but of abnormal autoimmune activation (Stenchever *et al.*, 2001). Thyroid antibodies serve as peripheral markers of disordered T-cell function (Kim *et al.*, 2015). Like thyroid antibodies, antiphospholipid antibodies have been noted to be more prevalent among women with recurrent miscarriage and are also thought to be a consequence of abnormal autoimmune activation. No correlation was identified between thyroid antibodies status and antiphospholipid antibodies status, which raises the possibility that they may be the result of different autoimmune abnormalities (Suzuki *et al.*, 2007). Indeed, antithyroid antibodies are sometimes present together with anticardiolipin antibodies (Reznikoff-Etievant *et al.*, 1999). It appears that the observed association is not due to the co-presence of any of these antibodies. However, this does not exclude the possibility that the thyroid antibodies are a marker of an as yet unidentified more generally heightened autoimmune state against the fetal-placental unit (Muller *et al.*, 1999; Rushworth *et al.*, 2015).

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