

**Original article**

**Comparison of Antiphospholipid Antibodies in Hypertensive with  
Normotensive Pregnant Women**

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**ABSTRACT**

**Objective:** The aim of this study was to assess the association between the occurrence of hypertension (HTN) in pregnancy and antiphospholipid antibodies.

**Methods:** We conducted a cross-sectional study of 100 pregnant women with their first pregnancy induced HTN and no history of thrombosis, renal disease or systemic autoimmune diseases. HTN was defined as blood pressure (BP) of 140/90 mmHg or higher on two measurements with 6 hours apart. Control group comprised of pregnant women without hypertension or proteinuria and without history of thrombosis or systemic autoimmune disease. Antiphospholipid Antibodies (Antiphospholipid IgG and IgM and anticardiolipin IgG and IgM) levels were measured in both groups.

**Results:** There were significantly higher titer of Antiphospholipid IgG and anticardiolipin IgG and IgM in case group ( $p < 0.05$ ). Antiphospholipid IgM had no difference between two groups ( $p = 0.14$ ). There were moderate but statistically significant correlation between blood pressure and parity ( $r = 0.3$ ;  $p = 0.0001$ ), gestational age and antiphospholipid IgM antibody level ( $r = 0.3$ ;  $p = 0.02$ ), and between gestational age and anticardiolipin IgM antibody level ( $r = 0.28$ ;  $p = 0.002$ ).

**Conclusion:** We found elevated levels of IgG and IgM anticardiolipin and IgG antiphospholipid antibodies in pregnancy induced HTN, but level of antiphospholipid IgM antibody was not different in hypertensive and normotensive women. (Rawal Med J 2007;32:173-175).

**Key words:** antiphospholipid antibodies, anticardiolipin antibodies, pregnancy, hypertension.

## **INTRODUCTION**

Hypertensive disorders of pregnancy is a major cause of mortality and morbidity in fetus and pregnant women;<sup>1</sup> most adverse outcome are related to preeclampsia syndrome which is defined by new-onset hypertension (HTN) with proteinuria during pregnancy and is more common in women with history of chronic HTN. In general, HTN in pregnant women defined as blood pressure (BP) of 140/90 mmHg or higher on two different occasions with 6 hours apart. Pregnancy induced HTN occurs in 8-10% of all pregnancies, and is an important cause of maternal mortality and morbidity, including placenta abruptia, pulmonary edema, disseminated intravascular coagulation, respiratory and hepatic failure and acute renal failure.<sup>1</sup> Fetal complications include prematurity, intrauterine growth retardation and fetal loss.<sup>1</sup> Antiphospholipid Antibodies are a heterogeneous population of autoantibodies against different target antigens predominantly anionic phospholipids or phospholipids-containing structures. Presence of antiphospholipid antibodies has been reported to have a strong association with variety of pregnancy induced complications such as spontaneous abortions pregnancy induced HTN, preeclampsia and intrauterine growth retardation.<sup>2</sup> Women with high titer of Antiphospholipid IgG have 28% chance of fetal loss.<sup>2</sup> The presence of IgG Antiphospholipid appears to be of greater significance than the presence of IgM in detecting women at risk of fetal loss.<sup>2-3</sup> The aim of this study was to compare the levels of Antiphospholipid Antibodies in hypertensive and normotensive pregnant women.

## **MATERIALS AND METHODS**

After approval of institutional ethics committee, and obtaining written informed consent from all of participants, we conducted a cross-sectional study of 100 pregnant women with their first pregnancy induced HTN and no histories of thrombosis or systemic autoimmune diseases. HTN was defined as blood pressure (BP) of 140/90 mmHg or higher on two separated measurements with 6 hours apart. Control group comprised of 100 pregnant women without hypertension or proteinuria and without histories of thrombosis or systemic autoimmune disease. Antiphospholipid IgG and IgM and anticardiolipin IgG and IgM were measured in both groups by using sensitive Elisa kits using frozen supernatant.<sup>2-4</sup>

The analysis design was a sequential plan with 5% type I error and 95% power. Categorical variables were compared with Chi-square or Fisher's exact test as appropriate and continuous variables with independent samples t –test. Mann-Whitney test was used as nonparametric test. Linear regression analysis was used for finding correlations between two continuous variables. All tests were two tailed and a level of significance was set at  $p \leq 0.05$ . Data analysis was performed using the SPSS v.13.0 (SPSS Inc, Chicago, IL).

## RESULTS

The main characteristics of cases and controls are shown in table 1.

The P values for Antiphospholipid IgG and IgM and anticardiolipin IgG and IgM antibodies were 0.01, 0.14, 0.0001 and 0.0001, respectively (table 2).

**Table 1. Basic parameters in hypertensive and control groups.**

	Hypertensive group	Control group	Standard deviation		P value
			Hypertensive	control	
Age	28.5	25.1	6.4	5.57	0.001
Gestational age	30	38.9	5.6	1.06	0.001
Gravidity	2.17	1.85	1.2	1.32	0.1
Parity	0.89	0.63	1.2	1.06	0.09
Weight(kg)	81.06	76.2	12.1	10.7	0.005
Height(cm)	157.9	157.5	20.2	20	0.5
Abortion rate	76%	58%	11	8	0.1
Blood pressure (systole 1)	113.5	110.4	19.9	9.9	0.1
Blood pressure (systole 2)	152.2	114.4	15.5	8.5	0.001
Blood pressure (diastole 1)	72.8	72.6	12.8	6.4	0.9
Blood pressure (diastole 2)	96.4	114	9.3	8.5	0.03

Difference between mean values of Antiphospholipid IgM antibodies in two study groups was not significant. There were moderate but statistically significant correlation between blood pressure and parity ( $r=0.3$ ;  $p=0.0001$ ), gestational age and antiphospholipid IgM antibody level ( $r=0.3$ ;  $p=0.02$ ), and between gestational age and anticardiolipin IgM antibody level ( $r=0.28$ ;  $p=0.002$ ) in hypertensive group.

**Table 2. Mean plasma levels of antiphospholipid and anticardiolipin antibodies in two groups.**

	Hypertensive group	Control group	95% confidence intervals of differences	P value
Antiphospholipid IgM	2.5	2	1.1-17	0.14
Antiphospholipid IgG	4.2	3	2.2-0.27	0.01
Anticardiolipin IgM	2.75	1.68	1.95-0.54	0.0001
anticardiolipin IgG	3.03	1.49	2.2-0.8	0.0001

## DISCUSSION

The spectrum of Antiphospholipid antibodies related disease was broad such as presence of arterial and venous thrombosis, autoimmune thrombocytopenia, fetal loss and pregnancy induced hypertension. Antiphospholipid antibodies include anticardiolipin antibodies, the lupus anticoagulant and antibodies to other phospholipids and antibodies to some phospholipids bindings proteins.<sup>2</sup> Low titer antibodies have been reported in 2-5 % healthy-young women.<sup>2</sup> The presence of antiphospholipid antibodies especially anticardiolipin antibodies increased pregnancy risk, as 59.1% IgG or IgM antibodies to one of the six phospholipids (cardiolipin, APS,API,APE, phosphoglycerol and phosphatidicacid) were seen as compared to controls (4.6%).<sup>2-4</sup>

Although there is still no general consensus on the precise type of antiphospholipid antibodies that should be tested in different clinical conditions, antibodies directed against phospholipid-associated plasma protein cofactors ( $\beta$ 2 glycoprotein I, prothrombin, annexin V, protein C, and protein S) have been reported to be linked to an increased risk of thrombosis and even preeclampsia.<sup>5-6</sup> Considering the thrombotic predisposition that is apparently linked to antiphospholipid antibodies in women, it was important to test for those antibodies during complicated pregnancies, in particular during preeclampsia, to determine possible predictive or therapeutic effects.<sup>5-7</sup>

The search for such an association between antiphospholipid antibodies and preeclampsia has resulted in conflicting results, probably because of case series with small samples or heterogeneity of selected women.<sup>6-9</sup> Pregnancy-induced hypertension was not associated with any of the antiphospholipid antibodies in some studies.<sup>10</sup> In this study we found a strong association between antiphospholipid antibodies and HTN of pregnancy, as reported by many previous investigators.<sup>11-15</sup> The limited data in this field clearly indicates the need for more longitudinal, prospective studies with larger sample sizes to further evaluate antiphospholipid antibodies and adverse outcomes, change in antiphospholipid antibodies levels during pregnancy (especially between the embryonic and fetal periods), and influence of other risk factors associated with pregnancy loss.

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