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LEFT VENTRICULAR FUNCTION IN PREECLAMPTIC PREGNANTS

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ÖZET: Hüsnü Çağlar, Murat Yeşil, Erdal Aktan, ASS İzmir Devlet Hastan 2. Kadın Hastalıkları ve Doğum ve Kardiyoloji Klinikleri. Preeklampt gebelerde sol ventriküler fonksiyonu biz bu çalışmamızda, preeklampt hastalarda sol ventrikül fonksiyonunu belirlemek için noninvaziv t metod olan ekokardiografiyi kullandık ve bulgularımızı normotansif trimestr gebelerinin ve gebe olmayan kadınların sol ventrik fonksiyonları ile karşılaştırdık. Sonuçta, tüm grupların sol ventrik fonksiyonlarının birbirinden anlamlı farklılıkları olmadığını gördü Fakat, diastol sonu hacimleri ve atım hacimlerini hesaplayıp, s ventrikül arka duvarı ve interventriküler septum kalınlıkları ölçtüğümüzde anlamlı farklılıklar bulduk. Bulgularımızı literatür i karşılaştırdık.

ABSTRACT: Hüsnü ÇAĞLAR, Murat YEŞİL, Erdal AKTAN, İzmir State Hospita 2. Gynecology and Obstetrics and Cardiology Clinics. Left Ventricul Function in Preeclamptic Pregnant.

We used a noninvasive method, echocardiography to assess the le ventricular function in preeclamptic patients, and also compared it wi the left ventricular function in normotensive third trimester pregnan and nonpregnant women. As a result, we concluded that left ventricul function in all groups were not significantly different from each othe But we found significant differences when we calculated end-diastol volumes, stroke volumes and the thicknesses of left ventricul posterior walls and interventricular septums. We discussed our resul with literature.

Anahtar sözcükler: Preeklampsi, sol ventrikül fonksiyonları
Key words : Preeclampsy, left ventricular functions

Although it is very obvious that preeclampsia may have so cardiologic complications, this clinical entity could not attract t interests of cardiologists for many years. So, there are only f reports about the effects of this entity on cardiovascular system.

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Currently, there are some investigators who showed that left ventricular performance in these patients is improved(1,2). But there are also authors who claim that the performance of left ventricle is impaired or unchanged in preeclamptic women, when compared to normotensive women(3,4). It is also reported that, there is no difference between the left ventricular performances of normotensive third trimester pregnants and nonpregnants(3,5).

So, we decided to use a noninvasive method, "echocardiogram" to assess the left ventricular performances of preeclamptic patients.

Material and Methods: We chose 15 preeclamptic patients with arterial pressure greater than 150/90 mm Hg, with proteinuria 0.5 gm/day or more. None of the preeclamptic patients had a history of previous hypertension. The preeclamptic women's age range was from 16 to 32. Their gestational age range was from 28 weeks to 39 weeks. All of the patients were primigravidas.

We also made a second group of 15 nulliparious third trimester pregnants, and a third group of 15 nonpregnant nulliparious women; who were between 20-31 years of age.

We performed echocardiographic measurements for these 3 groups. We used ALAKO system and a 2.25 MHz transducer. Echocardiograms were taken from the left sternal edge at a standard intercostal space. Women were at standard conditions when echocardiograms were taken.

The thickness of posterior left ventricular wall was measured for the leading edge of endocardial echo to the leading edge of the epicardial echo; the thickness of interventricular septum was measured from the leading edge of the right septal echo to the leading edge of left septal echo, and these two were measured at the beginnig of QRS complex. End-diastolic dimension (EDD) of the left ventricle was also measured at the beginnig of QRS complex, and left ventricular end-systolic dimension was measured at the point of smallest distance seperating septum from the posterior wall.

By using the echocardiographic data, we calculated the end-diastolic volume and end-systolic volume of left ventricle according to the formula;

$$\text{Volume} = \frac{7}{D+2.4} D^3$$ (D represents end-diastolic and end-systolic dimensions,).

We also calculated the stroke volume by subtracting end-systolic volume from end-diastolic volume. We used ejection fraction (EF) and fractional

shortening (FS) values to indicate the left ventricular performance, calculated them by formulas;

$$\% EF = \frac{EDD^3 - ESD^3}{EDD^3} \times 100 \qquad \text{and} \qquad \% FS = \frac{EDD - ESD}{EDD^3} \times 1($$

(In the formulas, EDD is for end-diastolic dimension and ESD is end-systolic dimension).

Results: The preeclamptic patients had greater systolic and diastc mean blood pressure values than two other groups. In preeclamptic gr the direct and derived echocardiographic values were as in the figure

	Non-pregnant	Normotensive pregnant women	Preeclamptic pregnant women
Left ventricular end-diastolic dimension - mm (mean)	44.1±2.1	48.4±2.1	45.7±3.2
Left ventricular end - systolic dimension-mm (mean)	29.2±2.4	31.8±2.4	30.3±3.7
% Ef (mean)	71.0±2.5	71.5±2.8	71.2±4.5
% FS (mean)	33.5±2.6	34.3±2.8	34.3±4.4
End-diastolic volume-ml (mean)	88.2±8.8	110.1±11.0	98.7±13.3
End-systolic volume-ml (mean)	32.8±5.4	4.07±7.2	37.8±11.9
Stroke volume ml (mean)	55.4±4.7	69.9±8.2	60.9±8.8
Posterior wall tickness-mm(mean)	8.0±0.6	9.0±0.7	9.7±0.9
Inter ventr. septum tickness mm (mean)	8.0±0.6	8.9±0.8	10.2±1.0

Figure : Direct and derived echocardiographic values of preeclampt patients.

Comment: In our study we found that normotensive and preeclamptic gro had greater mean end-diastolic and end-systolic left ventricular volur than nonpregnant groups, and left ventricular enlargement in pregnar may be related to this finding. These data agree to the investigatc echocardiographic data indicating the increased venous return as t cause of ventricular enlargement during pregnancy(6,7), and in th study it can also be seen that the mean end-diastolic volume preeclamptic pregnant group is smaller than that of normotensi pregnant group. It is reported that the lower plasma volume preeclamptic patients might be the cause of the different me end-diastolic and stroke volumes in preeclamptic and normotensi pregnants(8). As we look at the values of the end-systolic dimensions two pregnant groups, we can not see any significant differences betwe them, and naturally this is also same for the end-systolic volumes these groups. The mean stroke volumes of the groups from the lowest the greatest are respectively: nonpregnant women's, preeclampti pregnant women's and normotensive pregnant women's.

Although many authors do not agree with the left ventricular function in preeclamptic pregnants, we found that there is no significant differences between the preeclamptic and normotensive pregnant groups, and this result agree to that of Larkine(4). We also found that, the ventricular functions of normotensive pregnants and nonpregnant women did not differ significantly from each other. This is also like the finding of Kuzniar et al(8). In this study we evaluated the left ventricular functions by ejection fraction (EF) and fractional shortening (FS) values, and accepted left ventricular function as impaired when EF was below %54 and/or FS was below % 24; but we didn't find any value below these levels.

The mean values of the thicknesses of left ventricular posterior wall and interventricular septum are greatest in preeclamptic group, and lowest in nonpregnant group, the mean value of the normotensive group is between them. There was one patient whose posterior wall thickness was greater than 11 mm. and there were two patients whose interventricular septum thicknesses were greater than 11mm.

So, as a conclusion, althoug impaired left ventricular function is not a common finding in preeclamptic pregnants, it can be possible by an additional stress as labor or fluid therapy.

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