

*Research Article***Correlation of serum creatinine in occurrence of preeclampsia****Rabab M. Mahmoud, Manal M. Saber, Ayman G. Ghobrial and Hanan M. Kamel**

Department of Clinical pathology, Faculty of Medicine -Minia University

Abstract

Purpose: To assess the relation between serum creatinine level in pregnant women and correlation between its value and occurrence of preeclampsia. **Methods:** An 80 pregnant female were involved in the study. They were divided into 40 case group; pregnant females with risk factors of preeclampsia and 40 apparently healthy pregnant women as a control group. Serum creatinine was tested using auto-analyzer, using the commercially available kits. **Results:** Serum creatinine was significantly higher in women who developed preeclampsia later. **Conclusion:** In summary we found an association of serum creatinine and preeclampsia. we recommend to use serum creatinine test in screening in women who are at risk of having preeclampsia later in pregnancy.

Keywords: serum creatinine, pregnant women, preeclampsia.

Introduction

Preeclampsia (PE) is a disorder of pregnancy characterized by the onset of high blood pressure with heavy amount of protein in urine and/or severe symptoms (such as severe and persistent headaches) beginning after 20 weeks of pregnancy (Eiland et al., 2012).

The disorder usually occurs after 20 weeks of pregnancy and worsens over time (Abalos et al., 2013).

In severe disease there may be kidney dysfunction. (Organization et al., 2005).

PE increases the risk of poor outcomes for both the mother and the baby (If left untreated, it may result in seizures at which point it is known as eclampsia) (Eiland et al., 2012).

PE represents an important cause of maternal as well as perinatal morbidity and mortality (Cheng and Sharma, 2016).

The excessive activation of inflammatory or other systems lead to immune system disorders and the deposition of an overdose of immune complexes in the kidney, which increase vascular permeability to a certain degree and impair the kidney function. So, important significance for kidney function found in patients with hypertensive disorder complicating pregnancy (Luisa Isidro and Ruano, 2010).

Subjects and Methods

- **Study design**

The prospective cohort study was carried out at the Clinical Pathology Department, Faculty of Medicine, Minia University, Minia, Egypt. It was conducted on 80 subjects through the period June 2019 to December 2019. The hospital ethics committee approved this study and a written consent was obtained from each patient.

- **Subjects:**

The subjects included in the study were divided as follows:

- **Group I (patient group):**

It included 40 pregnant females with risk factors of preeclampsia. Their ages ranged from 18 to 45 years and gestational age was less than 16 weeks. The patients were selected from in-patient and

out-patient clinics of Gynecology & Obstetrics Department of Minia University Hospital, through the period June 2019 to December 2019.

- **Group II (control group):**

It included 40 apparently healthy pregnant women. All the control participants were matched with patient group in terms of age and gestational age.

- **Inclusion criteria:**

- 1) Women with maternal age between 18–45-year-old.
- 2) Women with ongoing pregnancy of less than 16 weeks of gestation.

Methods**A- Blood Sampling protocol:**

About 2 ml of venous blood was withdrawn from each subject by using a disposable plastic syringe after sterilization of skin with isopropyl alcohol (70%) swabs. This sample was withdrawn on plain tube. Blood left to be clotted in a plain tube for 30 min in the incubator then centrifuged for 15min at approximately 3000 g. The expressed serum was used for determination of serum creatinine level.

B- Methods used:

Using auto-analyzer SELECTRA, ELITech Group, clinical chemistry automation systems, Finland. Using the commercially available kits according to the manufacturer's instructions.

C- Statistical analysis:

The analysis of the data was carried out using the IBM SPSS 20.0 statistical package software and MedCalc version 12.2.1.0 (MedCalc Software, Ostend, Belgium). Data were expressed as median, interquartile range (IQR), mean± standard deviation (Heyward et al.) for quantitative measures in addition to both number and percentage for categorized data.

The normality of data was assessed using Kolmogorov-Smirnov test. Mann Whitney test was used for comparison between independent groups for non-parametric data and the

Chi-square test or Fisher's exact test were used to compare categorical variables. A P-value of 0.05 or less was considered significant.

Results

Comparison between the two groups regards age and gestational age

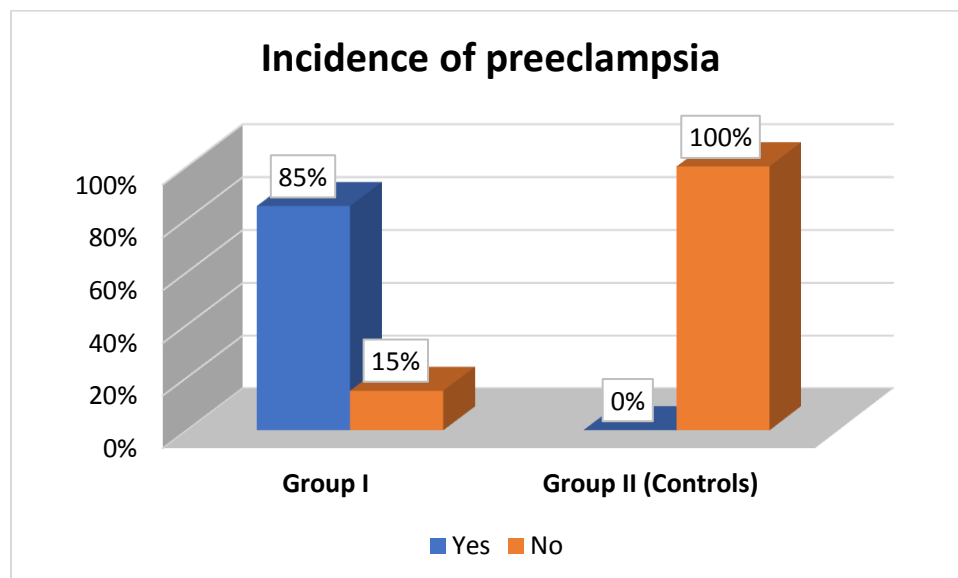
	Cases	Controls	Z _{MWU}	p
	(n=40)	(n=40)		
Age (in years)				
Median (IQR)	28 (22-31.5)	30.5 (24-36)	-1.617	0.106
Mean±SD	27.92±6.53	30.08±6.33		
Gestational age (in weeks)				
Median (IQR)	16 (16-17)	17 (16-18)	-1.447	0.148
Mean±SD	16.45±0.96	16.8±1.22		

All groups in our study showed similar age There was no statistically significant difference between the studied groups as regard age and gestational age.

Comparison between studied groups as regarding incidence of preeclampsia

	Group I (n=40)	Group II (Controls) (n=40)	p value
Occurrence of Preeclampsia			<0.001*
Yes	34 (85.0%)	0 (0.0%)	
No	6 (15.0%)	40 (100.0%)	

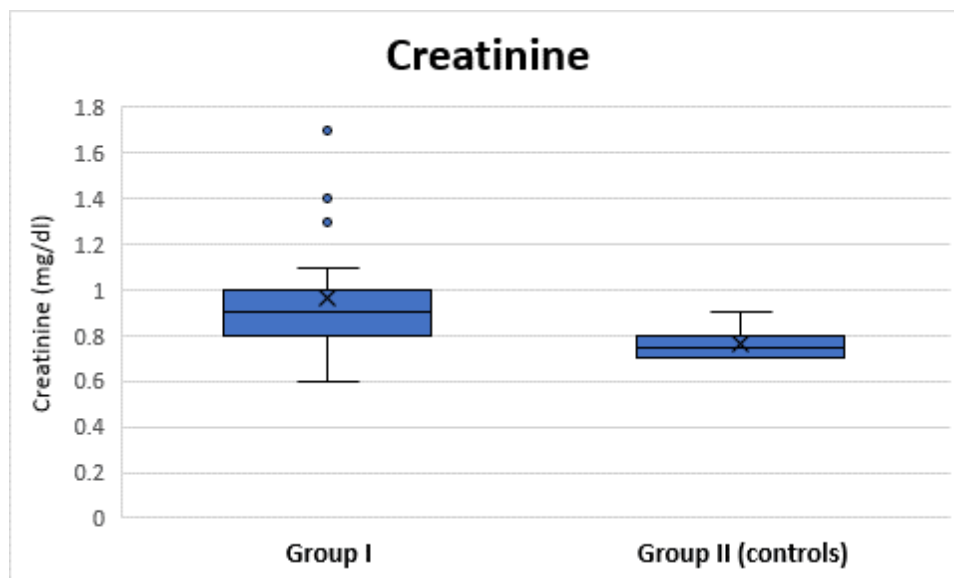
Among the 40 pregnant women with risk factors of preeclampsia, 34 women developed preeclampsia (85%) while no cases of preeclampsia were reported in control group.



Comparison between the two groups regarding serum creatinine

	Cases	Controls	Z _{MWU}	p
	(n=40)	(n=40)		
Creatinine (mg/dl)				
Median(IQR)	0.9 (0.8-1)	0.75 (0.7-0.8)	-4.183	<0.001*
Mean±SD	0.96±0.26	0.77±0.08		

Creatinine was higher in case group compared to control group and these differences were statistically significant.



Discussion

Preeclampsia (PE) involves 2 to 3% of all pregnancies and is a major cause of maternal and fetal morbidity and mortality around world (Knight et al., 2018).

Baseline assessment of renal function can be used as alter surveillance for preeclampsia as (Kuper et al., 2016) and this was in agreement with our results.

We studied the relation between serum creatinine level in pregnant women and its' correlation with occurrence of preeclampsia. Creatinine was significantly higher in case group compared to control group.

Reference

1. ABALOS, E., CUESTA, C., GROSSO, A. L., CHOU, D. & SAY, L. 2013. Global and regional estimates of preeclampsia and eclampsia: a systematic review. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 170, 1-7.
2. CHENG, S.-B. & SHARMA, S. Preeclampsia and health risks later in life: an immunological link. *Seminars in immunopathology*, 2016. Springer, 699-708.
3. EILAND, E., NZERUE, C. & FAULKNER, M. 2012. Preeclampsia 2012. *Journal of pregnancy*, 2012.
4. HEYWARD, C., SONES, J., LOB, H., YUEN, L., ABBOTT, K., HUANG, W., BEGUN, Z., BUTLER, S., AUGUST, A. & LEIFER, C. J. J. O. R. I. 2017. The decidua of preeclamptic-like BPH/5 mice exhibits an exaggerated inflammatory response during early pregnancy. 120, 27-33.
5. KUPER, S. G., TITA, A. T., YOUNGSTROM, M. L., ALLEN, S. E., TANG, Y., BIGGIO, J. R. & HARPER, L. M. 2016. Baseline Renal Function Tests and Adverse Outcomes in Patients With Chronic Hypertension. *Obstetrics and gynecology*, 128, 93.
6. LUISA ISIDRO, M. & RUANO, B. 2010. Bone disease in diabetes. *Current diabetes reviews*, 6, 144-155.
7. ORGANIZATION, W. H., CANADA, P. H. A. O. & CANADA, C. P. H. A. O. 2005. Preventing chronic diseases: a vital investment, World Health Organization.