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ASSOCIATION BETWEEN GAMMA GLUTAMYL TRANSFERASE, LACTATE DEHYDROGENASE ACTIVITY AND SEVERITY OF PREECLAMPSIA AMONG SUDANESE PREGNANT WOMEN

Majda Abdalmajeed Mohammed*[1] and Nassr Eldin M. A. Shrif [2]

[1]Department of Clinical chemistry. Faculty of Medical Laboratory Sciences, Al- Neelain University-Sudan.
[2]Department of Clinical chemistry. Faculty of Medical Laboratory Sciences, Alzaeim Alazhary University-sudan.

***Corresponding Author: Majda Abdalmajeed Mohammed**
Department of Clinical Chemistry. Faculty of Medical Laboratory Sciences, Al- Neelain University-Sudan.

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ABSTRACT
Background: Preeclampsia is the most common disorders affecting the pregnant women. **Objectives:** The aim of this study was to evaluate the activity of serum GGT and LDH among Sudanese pregnant women with preeclampsia. **Methods:** Case control study was conducted during the period from November to December 2016, fifty sample from known pregnant women with preeclampsia and fifty samples from healthy pregnant women as control. The level of LDH and GGT was measured using Mindray BS-120. Data were collected using structural questionnaire. Data analysis was carried out by means of statistical package for social science (SPSS version 16). **Results:** The mean level of GGT showed significant increased in pregnant women with preeclampsia when compared to healthy pregnant women with (P.value = 0.000).also there was significant increased of LDH level in pregnant women with preeclampsia when compared with healthy pregnant women with (P.value = 0.00).There was significant positive correlation between GGT, LDH and severity of preeclampsia (p-value =0.000). **Conclusion**: Increased levels of GGT and LDH in pregnant women with preeclampsia.

KEYWORDS: GGT, LDH and preeclampsia.

INTRODUCTION
Preeclampsia is a clinical manifestation characterized by hypertension, proteinuria and edema that occurs after 20th week of pregnancy. It is a multisystem disorder of pregnancy with potentially severe consequences for both mother and child.[1] It affects about 5-8% of all pregnancies and is a major cause of maternal, fetal and neonatal mortality and morbidity.[2,3] The etiology of preeclampsia is unknown but thought to be related to hypoxia in the placenta and endothelial dysfunction.[4] The various causes that leads to these abnormalities. are genetic and dietary causes, immunological causes, race, increased oxidative stress etc.[5] Since preeclampsia is a syndrome virtually affecting all maternal organ systems, it is associated with different clinical characteristics, prevention, diagnosis and therapy where a disease requires a close interdisciplinary cooperation.[6] There is increasing evidence that endothelial cell and altered endothelial cell function play an important role in the pathogenesis of preeclampsia. Serum lactate dehydrogenase (LDH) and serum gamma glutamyl transferase (GGT) are most often measured to evaluate the presence of tissue damage associated with endothelial damage. Dysfunction of endothelial cells can contribute to inappropriate vasoconstriction and platelet aggregation which are early signs of hypertension.[7] The enzyme γ-glutamyltransferase (GGT) is widely distributed throughout the body in many tissues, particularly the liver. At the cellular level, significant activity occurs in both endothelium and epithelium.[8] Association between serum GGT concentration and blood pressure in non pregnant hypertensive patients have been reported in some population surveys. Also raised levels of serum GGT have been reported in stroke patients, which were assumed to be due to vascular endothelial damage.[8,9] Lactate dehydrogenase (LDH) is an intracellular enzyme which converts lactic acid to pyruvic acid and its elevated levels indicates cellular death and leakage of enzyme from the cell.[10] Increased levels of LDH were found in association with preeclampsia in a limited numbers of studies.[11,12] This is study that examines the frequency symptoms occurring in severely preeclamptic patients according to the levels of GGT and LDH, indicating multiorgan involvement and severity of the disease.

MATERIALS AND METHODS
Case control study was conducted at Omdurman Maternity Hospital during the period from November to December 2016. Fifty preeclamptic pregnant women

aged from 20-40 years, and fifty healthy pregnant women as control were enrolled in the study. Permission of this study was obtained from to local authorities in the area of the study. An informed consent was obtained from each participant in the study after explaining objectives of the study. Interview and questionnaire was used to collect data. 5 ml of venous blood was collected from each participant. Serum was separated directly to the plain container by centrifugation at (300 rpm) for 5 minutes. Serum levels of GGT and LDH was measured using Mindray BS-120. Statistical analysis was performed using statistical package for windows (SPSS v16). Fisher's exact test was used to assess the categorical variables and student *t*-test or kruskal Walis for continuous variables. Data are presented as mean ± standard deviation (SD). *P* value less than 0.05 was considered statistically significant.

RESULTS

Fifty sample from preeclamptic pregnant women as case and fifty samples from healthy pregnant women as control were enrolled in the study.

As shown in (Table 1), the mean level of GGT showed significant increased in pregnant women with preeclampsia when compared with healthy pregnant women (P.value = 0.000). also there was significant increased of LDH level in preeclamptic pregnant women when compared to healthy pregnant women with (P.value = 0.00).

Table (1) comparison the levels of GGT and LDH between patients (in mild and sever preeclampsia) versus control group.

Parameters	Control (Mean±SD) N=50	Mild preeclampsia (Mean±SD) N=24	Sever preeclampsia (Mean±SD) N=26	*P-value*
GGT	21.46±8.92	47.67±9.33	78.46±14.61	0.000** 0.000**
LDH	294.16±86.81	527.63±66.80	779±344.79	0.000** 0.000**

P-value 0.05≥ consider as significant

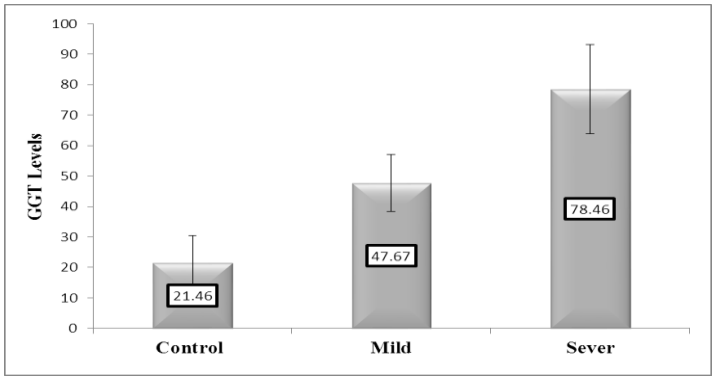

Figure (1) GGT levels in case and control.

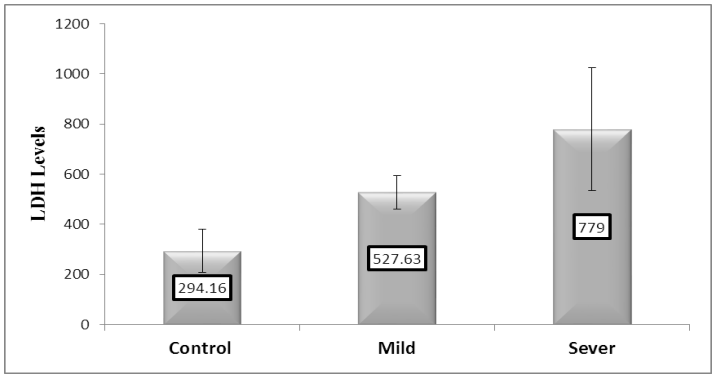

Figure (2) LDH level in case and control

Table (2) Comparison the levels of GGT and LDH between mild and sever preeclampsia .

Parameters	Mild preeclampsia (Mean±SD) N=24	Sever preeclampsia (Mean±SD) N=26	*P-value*
GGT	47.67±9.33	78.46±14.61	0.000**
LDH	527.63±66.80	779±344.79	0.001**

P-value 0.05≥ consider as significant.

Figure (3) relationship between GGT level and diastolic blood pressure in sever preeclampsia

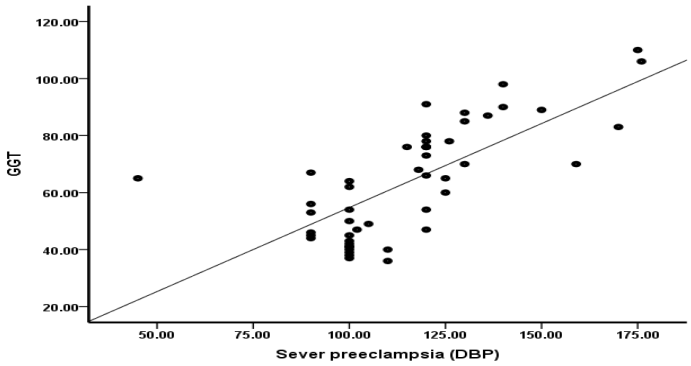

Figure (3): scatter plot show significant positive correlation between gammaglutamyltransferase and diastolic blood pressure in severe preeclampsia p value =0.000 and R = 0.716 Correlation is significant at the 0.05 >level**

Figure (4) relationship between LDH level and diastolic blood pressure

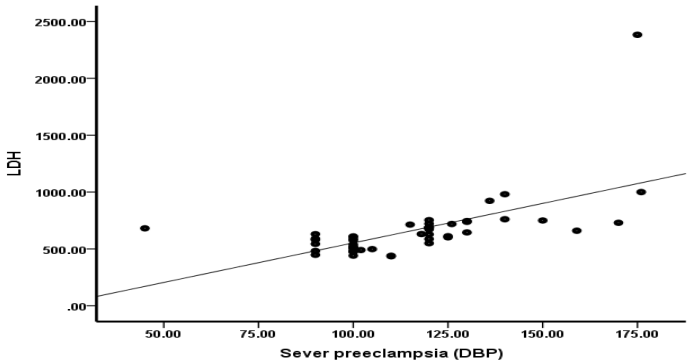

Figure (4) scatter plot show significant positive correlation between lactate dehydrogenase and diastolic blood pressure in sever preeclampsia p value =0.000 and R =0.595 Correlation is significant at the 0.05> level.**

DISCUSSION

In this study fifty preeclamptic pregnant women as case and fifty healthy pregnant women as control were enrolled in the study .serum GGT and LDH were measured. it was found that 70% of sever preeclamptic women had abnormal levels of LDH and GGT the mean level of LDH was(779 U/L) and the mean level of GGT was(78.46U/L) . In agreement with the prospective study was conducted in the Department of Biochemistry, S.R.T.R. Medical College and Hospital, Ambajogai during the period of 2006 -2007. A total of 50 preeclampsia women (24 with mild and 26 with severe Preeclampsia) and 50 healthy pregnant women (controls) were enrolled in the study the mean level of LDH >700 IU/L(5).

We propose that the multiorgan dysfunction in severe preeclampsia caused by vascular endothelial damage, including maternal liver, kidney, lungs and coagulation system; will lead to excessive LDH leakage and elevated levels in serum due to cellular dysfunction(13).

The level of LDH increase in severe preeclampsia 779 IU/L , rather than mild preeclampsia 527.63 IU/L ,with P value. 000 that is agreement with previous findings.

In our study, it was found that 70 % of preeclamptic women had abnormal high levels of GGT the mean was 78.46 IU/L when compared to control group .this finding was agreement with previous findings the mean level of GGT > 70 IU/L(5). The level of GGT increase in severe preeclampsia(78.46U/L) rather than mild preeclampsia (47.67 IU/L), with P value 0.000.

Also our result there is showed significant positive correlation between lactate dehydrogenase and blood pressure of Sudanese pregnant women with severe and mild hypertensive preeclampsia disease. Use of LDH as biochemical markers which reflects the severity of preeclampsia and useful for the management of preeclampsia to decrease maternal and fetal morbidity and mortalityFurther explorations of the effect of preeclampsia on other parameters. More studies to determine the specific cause of the increase level of LDH, GGT and how to manage it. Periodically check the lactate dehydrogenase and blood pressure for pregnant women infected with preeclampsia so recommended to be done. Comparison of the result with more data collected from pregnant women such as the larger size of the sample to determine the exactly exact association of

preeclampsia and level of Lactate dehydrogenase should be carefully analyzed and interpreted.

CONCLUSIONS

The present study concludes, the Levels of LDH and GGT was increased in Sudanese pregnant women with hypertensive preeclampsia disease. The level of LDH and GGT was increased in severe preeclampsia more than mild preeclampsia. And also this study Showed positive correlation between LDH, GGT and diastolic blood pressure of Sudanese pregnant women in severe or mild hypertensive preeclampsia disease.

REFERENCES

1. F. Gary Cunningham, Kenneth J. Leveno, Steven L. Bloom, John C. Hauth, Dwight J. Rouse, Catherine Y. Spong. Williams Obstetrics- 23rded. New York, NY: McGraw-Hill; 2010; 706-756.
2. WHO, 2004. Bethesda, MD. Global Burden of Disease for the Year 2001 by World Bank Region, for Use in Disease Control Priorities in Developing Countries, National Institutes of Health: WHO. Make every mother and child count. World Health Report, 2005, Geneva: World Health Organization, 2005. 2 nded.
3. Stekkinger E, Zandstra M, Peeters LL, Spaandernen ME. Early-onset preeclampsia and the prevalence of postpartum metabolic syndrome. Obstet Gynaecol 2009 Nov; 114(5): 1076-84.
4. Kay HH, Zhu S, Tsoi S. Hypoxia and lactate production in trophoblast cells. Placenta 2007; 28(8-9): 854-60.
5. Lopez-Jaramillo P, Casas JP, Serrano N. Preeclampsia: from epidemiology observation to molecular mechanisms. Brazil J Med Biol Res 2001; 34: 1227-35.
6. Jan AK, Jamil M. Management of preeclampsia and Eclampsia. JPMI 2000; 14(1): 67-71.
7. Pasaoglu H, Bulduk G, Ogus E, Pasaoglu A, et al. Nitric oxide, lipid peroxide and uric acid levels in preeclampsia and eclampsia. Tohoku J Exp Med 2004; 202(2): 87-92.
8. Yamada Y, Ishizaki M, Kido T, et al. Relationship between Gamma- Glutamyl Transferase Activity and Blood Pressure in Middle Aged Male and Female Non-Drinkers. J.HumHypertens, 1990; 4: 609-14.
9. Peck K, Shinton R, Beevers DG. Is Serum Gamma-Glutamyl Transferase a Good Marker of Alcohol Intake in Stroke Patients? Postgrad Med. J. 1990; 66: 710-13.
10. H. S. Quablan and Associates. Lactic Dehydrogenase as a Biochemical Marker of Adverse Pregnancy Outcome in Severe Preeclampsia. Med. Sci. Monit 2005; (8): CR 393-397.
11. Peralta Pedrero MI, Basavilvazo et al. Clinical Significance of Laboratory Determination Sinpreeclamptic Patients. Gnecol Obstet Mex, 2004; 72: 57-62.
12. Beyer C: Lactate Dehydrogenase Isoenzymes in Serum of Patients with Preeclampsia/ Eclampsia Complicated by the HELLP Syndrome. Clin. Chim. Acta, 1991; 202: 119-20.
13. Weinstein L. Preeclampsia-Eclampsia with Hemolysis Elevated Liver Enzymes and Thrombocytopenia. Obstet Gynecol, 1985; 66: 657-59.