THE IMPACT OF EXERCISE ON LEVELS OF LIVER ENZYMES AND PLATELETS COUNT IN PREGNANT LADIES: A COMPARATIVE STUDY

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ABSTRACT

Introduction: Preeclampsia and HELLP syndrome are the major health problems during pregnancy. It complicates 3%–8% of pregnancies and causes marked increase in perinatal, maternal morbidity, and mortality. Although the exact pathophysiology of preeclampsia is not completely understood, certain factors have been attributed to it, which include deficient trophoblastic invasion of the maternal vascular bed with subsequent reduction of placental blood flow. HELLP syndrome complicates 10 to 20% cases of pre-eclampsia and eclampsia. Sometimes it becomes difficult to differentiate initially from pregnancy induced cholestatic jaundice.

Aims and objectives: The basic aim of the study is to analyze the levels of alanine amino transferase (ALT) and platelets in pre-exercise pregnant women and compare them with levels after doing light exercise, and compare them.

Methodology of the study: This was a randomized control study conducted in Gynae and medical OPD of a tertiary care hospitals Hayatabad Medical Complex (HMC) in Peshawar during Sep: 2018 to December 2018. We collected the data from 78 female patients who visited OPD regularly for their anti-natal checkup. We divided the data into two groups one was those who were pregnant and visited OPD for the first time. we collected all the informations from them and enrolled them in our study after getting their consent. We took their blood samples for full blood count and ALT. Then advised them to start light exercise (half an hour walk daily) till next 2 visits. We collected all the basic characteristics and blood samples for the Platelets and ALT levels of selected patients on each visit. We recorded their Hb levels, BMI and mean ALT levels for the analysis of platelet count and liver function in pregnant women. We took another group of 78 pregnant women randomly who came for their antinatal care and were not doing any sort of exercise program.

Results: The data were collected from 110 patients initially on their first visit but only 78 patients followed the exercise instructions regularly and came for 2 more visits. Mean age of these sedentary pregnant women are 26± 3.5 and regular exercising primigravida women are 27.4 ± 2.5. BMI of exercising women was noted as 26.4±2.4 and in sedentary women as 24.12±2.1. Results shows that Hb level of exercising women becomes high as compared to non-working women. The mean level of ALT in non-exercising women are 45.6 ± 10.2 i.u/dl and in regular exercising women are 28.41 ± 7.4i.u/dl. Similarly the mean Platelet count in sedentary is 216.34 ± 12.33 and in exercising pregnant women was 271 ± 33.45.

Conclusion: It is concluded that working and regularly light exercising may keep ALT low normal and platelet count high normal which may reduce the chances of HELLP syndrome and pregnancy induced high level of ALT.

Key Words: ALT, Platelet count, Pregnancy, Health, Diseases

INTRODUCTION

Preeclampsia and or HELLP syndrome are the major health problems during pregnancy. It complicates 3%–8% of pregnancies and causes marked increase in perinatal, maternal morbidity, and mortality. Although the exact pathophysiology of preeclampsia is not completely understood, certain factors have been attributed to it, which include deficient trophoblastic invasion of the maternal vascular bed with subsequent reduction of placental blood flow[1]. HELLP syndrome complicates 10 to 20% pre-eclampsia or eclampsia patients generally and 0.2 to 0.4 % independently can affect the pregnant women[2]. Primigravida (PG), defined as a woman who conceives for the first time, is in a high-risk group to develop either of these problems or both, complicating each other and will increase the bad outcome of pregnancy[3]. PGs are at significantly higher risk for prolonged first and second stage of labor, increased chances of fetal distress during labor and need for intensive monitoring as compared to the multigravidas[4]. PGs are also at significantly increased risk for operative vaginal delivery and emergency cesarean section. The chances of primary postpartum hemorrhage in PGs are found to be more, and perinatal morbidity is also increased in the group[5]. Higher Platelet count (PC) is associated with cardiovascular disease and vascular complications as a result of its role in inflammation and thrombosis. Plate-

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lets activation also observed in people with diabetes, hypertryglyceridemia and insulin resistance[6]. Diabetes, hypertriglyceridemia, and insulin resistance are strongly associated with metabolic syndrome (MS), and previous studies have found that PC is also elevated in patients with MS after adjustment for age, gender, ethnicity, and total cholesterol[7].

Placental under perfusion initiates widespread systemic, maternal endothelial dysfunction, and increased vascular permeability. Coagulation system is activated by the contact of platelets with the injured endothelium leading to increase in consumption as well as bone marrow production of platelets[8]. Various indices are used to measure platelet functions, for example, the platelet count (PC), mean platelet volume (MPV), the PC to MPV ratio, and platelet distribution width (PDW); PDW measures platelet size distribution[9]. The utility of different platelets indices as predictors of preeclampsia has been studied previously; however, reports in this regard are controversial[10].

Aims and objectives

The basic aim of the study is to analyze the impact of exercise on levels of ALT and platelets count in pregnant women and compare them with sedentary pregnant women.

METHODOLOGY OF THE STUDY

This was a randomized control study conducted in Gynae and medical OPD of a tertiary care hospitals (HMC) in Peshawar during Sep: 2018 to December, 2018. We collected the data from two groups. in one group of 78 pregnant women, who were fulfilling our selection criteria were enrolled voluntarily. We collected blood sample and then advised them to keep on doing light exercise daily (half an hour walk) regularly and come to OPD for check up and giving us their blood samples. we followed the women of this group for 2 more visits and collected their blood samples for blood count and ALT levels. We took another group of 78 pregnant women randomly and they had sedentary life. We did not keep them on exercise program. We divided the data into two groups one was those who were advised exercising pregnant women and second group was non-exercising group women selected randomly from OPD. We collected all the basic characteristics of selected patients of both groups. We recorded their Hb levels, BMI, mean ALT and Platelet count levels for analysis and comparison. Non probability convenient sampling method was used on the basis of inclusion and exclusion criteria.

Statistical analysis

The collected data were analyzed using SPSS software (version 17). The results are presented as a mean with 95% confidence interval limits or standard deviations. The significant value for $P < .05$ was accepted as statistically significant.

RESULTS

The data were collected from 78 patients with the mean age of sedentary life pregnant women are 26± 3.5 and 78 exercising pregnant women are 27.4 ± 2.5. The mean Hb level were differ significantly in exercising and non-exercising women, as mean Hb level is 10.5±2.31 and 12.4±2.6 among exercising and non-exercising women respectively. BMI of exercising women was noted as 26.4±2.4 and in non- exercising women as 24.12±2.1. Results shows that Hb level of exercising women becomes high as compared to non-exercising women. The mean level of ALT in non-exercising women are 45.6 ± 10.2 i.u/dl and in regular exercising women

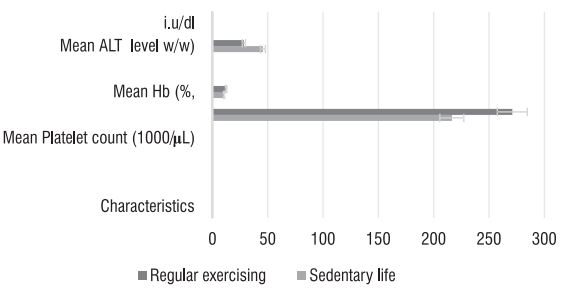

Figure 1: Comparison of levels of Hb, Mean Platelet count and mean ALT level Exercising and Non-exercising group of pregnant.

Table 1: Analysis of levels of Hb and ALT levels in both groups of selected patients

Characteristics	Non-Exercising Pregnant women	Exercising Pregnant Women	P Value
Maternal age (years) mean	26±3.5	27.4±2.5	.005
Gestational age in weeks mean	27.4 ± 2.21	26 ±3.6	.005
BMI mean	26.4± 2.4	24.12 ± 2.1	.002
Mean Platelet count (1000/ μL)	216.34 ± 12.33	271 ± 33.45	.001
Mean Hb (%, w/w)	10.5±2.31	12.43±2.6	.001
Mean ALT level i.u/dl	45.6 ± 10.2	28.41 ± 7.4	.001

are 28.41 ± 7.4i.u/dl. Similarly the platelet count remained high in exercising pregnant women 271 ± 33.45 while mean platelet count in non-exercising pregnant women was 216.34 ± 12.33/1000 μl

DISCUSSION

Our results shows that those pregnant women who do regular light exercise and physically active, have more good results as compared to sedentary pregnant women. We looked for two variables like ALT levels and platelets count in all these pregnant women of both the groups. In this study we depend the result on EXERCISE in one group and non-exercise 2nd group and then compared both the results. We found that in exercising group of pregnant women, mean ALT level was at lower limit of normal level and platelet count was found at higher level of normal limit. While in Non-exercising pregnant women ALT level found at higher level of normal limit and mean platelets counts were found at lower of normal limit. This picture may lead to become a risk for HELLP syndrome.

Pregnancy is the normal incident in the life of a women body, every pregnancy is a unique experience for women and each pregnancy the women experience will be new and adequately different from the previous[11]. The anatomical and physiological changes in pregnancy are associated with minor discomforts between women during pregnancy. Self-management regarding minor discomforts and practices during prenatal period is beneficial for pregnant women so practices of women about self-management are necessary for their health protection. Pregnancy induced hypertension is thought to be one of the major causes of maternal death and sufferings all over the country[12]. This study was conducted to know prevalence of pregnancy induced elevated ALT in 2nd trimester in a teaching hospital. It is worth to mention that Yavuzcan et al observed no significant difference in the MPV between women with severe preeclampsia, healthy pregnant women, and healthy non-pregnant women[13]. It is noteworthy that some researchers failed to confirm PC and MPV as predictors of preeclampsia probably because of the differences in the methods and/or equipment used to obtain hemogram[14]. Contact of platelets with the injured endothelium activates the coagulation system, which can increase both consumption and bone marrow production of platelets[15]. Enhanced thrombopoiesis produces younger platelets, which are larger (increased MPV) than older platelets, and they are metabolically and enzymatically more active[16]. But platelets elevated during or after exercise will not affect the platelet activity.[17]

CONCLUSION

It is concluded that working regular light exercise may reduce the chances of HELLP syndrome and pregnancy induced increased ALT.

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