Prospective Study of Relationship between Fetal Growth Rate and Presence of Maternal Liver Steatosis in Nondiabetic Pregnant Patients

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Abstract: This study concerns to study relationship between fetal growth rate and presence of maternal liver steatosis in nondiabetic pregnant patients, were the study performed on female pregnant mothers, Sudanese nationality between 18-45 years old, with high body mass index and at least stage one of liver steatosis. In main three hospitals in period from 2016 to 2018. using mindray machine SD6, made in china, with 5MHz curvilinear transducer.
the frequency and percent of pregnant trimester, steatosis grade and family history were the frequency and percent for trimester was 2nd 29 patients and 3rd was 35 patients with percentage 45.3% and 54.7% respectively. For steatosis grade was two grade mild with 60 patients 93.8% and moderate 4 with 6.3%. and the family history with negative history 24 patients 37.5% and positive 40 patients with 62.5% among all patients.
And the show correlation between Trimester and steatosis grade were the patients with 2nd trimester correlate with mild and moderate steatosis grade 27 patient's mild and 2 moderate, and the 3rd trimester 33 patient's mild and just two patient moderate.
Keywords: fetal growth, pregnant patients, maternal liver steatosis, nondiabetic

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I. Introduction

Management of pregnant women with liver disease is a common clinical scenario, and one that can be challenging given the need to consider not only the expectant mother, but also the unborn fetus in treatment decisions.

Pregnancy associated liver diseases affect up to 3% of pregnant women and are the most frequent cause of liver dysfunction in pregnancy. When severe, they are associated with significant morbidity and mortality for both mother and infant [1–3]. A rapid evaluation to distinguish them from non-pregnancy related liver dysfunction is essential, in order to facilitate appropriate management.

Management of jaundice during pregnancy especially in third trimester remains a dilemma for the obstetrician because of its varied etiology, unpredictable prognosis and guarded perinatal outcome. Liver disease in pregnancy is not common but can be a significant cause of maternal and fetal morbidity and mortality, frequently appearing in the triennial confidential enquiries.

Diagnosing the etiology of jaundice is extremely important in pregnant patients as certain conditions like Acute fatty liver of pregnancy (AFLP), HELLP syndrome and intra-hepatic cholestasis of pregnancy (ICP) may require early termination of pregnancy even in the presence of jaundice and or coagulation failure [4]. On the other hand, in conditions like acute viral hepatitis one must try to prolong pregnancy till the liver has recovered. Thus, the maternal and fetal outcomes of pregnancy can significantly be improved by appropriate management. Acute fatty liver of pregnancy is a rare but life threatening cause of jaundice in the third trimester of pregnancy and early postpartum period. It is associated a high maternal and neonatal mortality.

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Once diagnosed, prompt delivery is associated with a significantly improved outcome but peripartum management becomes difficult if the pregnancy is complicated by coagulation failure also.Both rodent and primate models of maternal high-fat diet (HFD) feeding have identified that offspring of obese mothers are at increased risk of obesity, glucose intolerance and diabetes, hepatic steatosis and endothelial injury [5,6]. Though the kidney is a highly vascular organ that is very responsive to hemodynamic, metabolic and inflammatory changes [7], the link between maternal obesity and CKD has not clearly been made.

Our recent studies have identified that rodent offspring of obese mothers have increased renal damage including [8] fibrosis, inflammatory and oxidative stress changes. As such, exposure to maternal obesity in utero may propagate renal dysfunction in offspring through increasing the risk of metabolic syndrome, which can further be compounded by the development of diabetesLater in life.

Non-alcoholic fatty liver disease (NAFLD) is the most prevalent form of chronic liver disease in the United States affecting up to 20–30% of the western world [9]. NAFLD encompasses a spectrum of disease ranging from isolated hepatic steatosis to steatosis with inflammation and hepatocyte injury [non-alcoholic steatohepatitis (NASH)]. NAFLD is an increasingly common cause of cirrhosis and hepatocellular carcinoma and is on trajectory to become the most frequent indication for liver transplantation in the United States [10,11]. In light of the increasing prevalence and disease burden of NAFLD it is important to identify persons with NAFLD prior to the development of advanced liver disease.

II. Material and method:

The study is case control study, will be performed on female pregnant mothers, Sudanese nationality between 18-45years old, with high body mass index and at least stage one of liver steatosis. In police hospital, General Omar Sawi medical complex between 2016 -2018. Multiple gestations, or pregnancy complicated by gestational anomalies will be excluded. Patient's age, number of previous births, weight and length will be taken from the patient's records. BMI will be calculated using the standard formula described by WHO: the maternal weight in kilograms divided by the squired maternal height. An abdominal scan will be performed to detect and determine the stage of liver steatosis as described previously. Fetal measurements will be taken are BPD, FL, GA and fetal weight during routine pregnancy follow up ultrasound,using Mindray machine SD6, made in china, with 5MHz curvilinear transducer.

Scanningtechnique: Longitudinal scan from outer margin of the left to the outer margin of the right lobe. Transverse scan with the probe angled cephalic to include the superior margin to the inferior margin of the left and right lobe of the liver. Subcostal scan to examine the whole of the right lobe. Intercostal scan which is a supplementary view for examining the right lobe of the liver especially when the right lobe is well within the rib cage. Stage of liver steatosis was determined as previously mentioned in chapter tow for mild stage 1 to severe in stage 3.

III. Results

Table 1. Show descriptive statistics for all patients:

	Mean	STD	Minimum	Maximum
Ageys	30.38	6.977	19	45
Weight kg	94.27	10.205	76	130
Height cm	159.05	7.041	147	176
BMI kg/cm^2	37.20	4.262	24	47
FL	48.69	15.181	18	99
BPD	64.48	15.916	33	99
GA_LMP	29.323	6.5830	11.0	41.1

Table 2. show the frequency and percent of pregnant trimester, steatosis grade andfamily history:

Trimester	Frequency	Percent	**Steatosis grade**	Frequency	Percent	**Family History**	Frequency	Percent
2nd	29	45.3%	Mild	60	93.8%	Negative	24	37.5%
3rd	35	54.7%	Moderate	4	6.3%	positive	40	62.5%
Total	64	100.0%	Total	64	100.0%	Total	64	100.0%

Table 3. show correlate between Trimester and steatosisgrade:

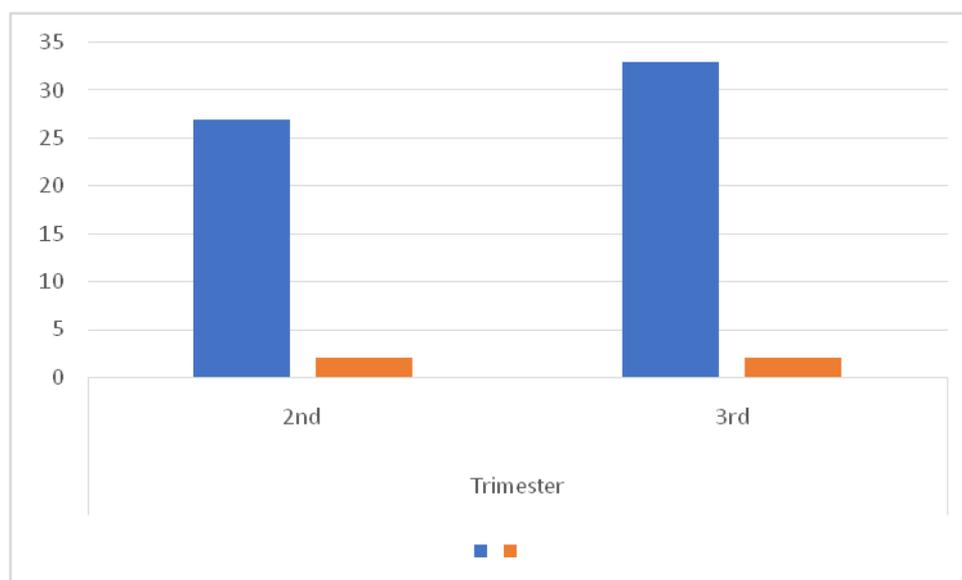| Trimester	Steatosis grade		Total
	Mild	Moderate	
2nd	27	2	29
3rd	33	2	35
Total	60	4	64

Figure 1. show correlate between Trimester and steatosis grade

IV.   Discussion

Steatosis is an acquired, reversible disorder of metabolism, resulting in an accumulation of triglycerides within the hepatocytes. Most commonly associated with obesity, maternal obesity can result in negative outcomes for both women and fetuses.

Table 1. show statistical parameters for all patients and the variables was age, weight, height and body mass index. And the measurement was FL, BPD and GA. All this presented as mean, standard deviation, minimum and maximum, the mean and STD for age 30.38 ± 6.98 years, for weight height and BMI was 94.27 ± 10.205 kg, 159.05 ± 7.041 cm and 37.20 ±4.262 kg/cm^2

Table 2. show the frequency and percent of pregnant trimester, steatosis grade andfamily history were the frequency and percent for trimester was 2nd 29 patients and 3rd was 35 patients with percentage 45.3% and 54.7% respectively. For steatosis grade was two grade mild with 60 patients 93.8% and moderate 4 with 6.3%. and the family history with negative history 24 patients 37.5% and positive 40 patients with 62.5% among all patients.

Table 3. show correlate between Trimester and steatosis grade were the patients with 2nd trimester correlate with mild and moderate steatosis grade 27 patient's mild and 2 moderate, and the 3rd trimester 33 patient's mild and just two patient moderate as shown in figure 1.

V.   Conclusion

study relationship between fetal growth rate and presence of maternal liver steatosis in nondiabetic pregnant patients, thestudy wasperformed on female pregnant mothers, Sudanese nationality between 18-45 years old, with high body mass index and at least stage one of liver steatosis. In main three hospitals in period from 2016 to 2018. using mindray machine SD6, made in china, with 5MHz curvilinear transducer.

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