Assessment of lipid profile in sudanese pregnant women health essay

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Abstract:

Background: The pathological relevance of serum lipid concentrations is supported by the observation that they might be a cause of cardiovascular disease and complications in pregnancy. changes in serum lipid profile. in normal pregnancy were reported in some previous studies. Objective: This study aimed to assess the lipid profiles in Sudanese pregnant women. Methology: this study was case control, hospital based study, Sudanese pregnant women . attending Wadmadeni Police Hospital. during July 2011 to December 2011. 150 women were included in the study of two groups consisted of 115 pregnant women in different trimesters and 35 (age-matched (18-45)) healthy non-pregnant women taken as control. Five ml of venous blood was collected for estimation of lipid profiles (total cholesterol, triglyceride, low and high density lipoprotein cholesterol). Pregnancy has

been found to be associated with changes in lipid profiles. Results: Mean ± SD of all parameters (TC, TGs, HDL-c and LDL-c) respectively in pregnant women were 160. 90±27. 12, 146. 6±70. 99, 70. 59± 24. 48, 45. 46 ± 16. 94 while the mean ± SD of all parameters (TC, TGs, HDL-c and LDL-c) respectively in non pregnant women were 159. 00 ± 38. 63, 151. 20 ± 46. 85, 54. 69 ± 15. 18, 60. 03 ± 5. 914. A significant decrease in high density lipoprotein cholesterol concentration was observed in pregnant women when compared with control group (p= 0. 0004). Whereas, the low density lipoprotein cholesterol level was significantly increased (p= 0. 0001). However, the concentrations of total cholesterol and triglyceride were not significantly different. Conclusions: Conclusively, changes in lipid profiles may lead to the development of coronary heart disease, arteriosclerosis, hypertension and other diseases associated with dyslipidaemia with in pregnancy. Key words: Pregnant Women, lipid Profile, Sudanese, heart disease.

Introduction:

Lipids are the principal form of stored energy in most organisms and major constituents of cellular membranes; they play a variety of cellular roles (Nelson and Cox, 2004). Lipoprotein consists of both lipids and proteins; the proteins are bound bounded to the lipids or their derivatives and since lipid particles are insoluble in the blood so the main function of lipoproteins is to transport lipids to the different parts of the body via the circulation (Garrett and Grisham, 1995). Lipoproteins are classified according to their functions and density into various types: chylomicrons which carry triacylglycerol from the liver and skeletal muscles to adipose tissue, very low density lipoprotein

cholesterol that carries endogenous triacylglycerol from the liver to adipose tissue, intermediate density lipoprotein cholesterol which is intermediate between very low density lipoprotein cholesterol and low density lipoprotein cholesterol and is not usually detectable in the blood, low density lipoprotein cholesterol which carries cholesterol from the liver to cells of the body and sometimes referred as ‘ bad cholesterol’ and high density lipoprotein cholesterol that collects cholesterol from the body’s tissues, and bring it back to the liver and sometimes referred to as " good cholesterol" lipoprotein (Murray, et al, 2006). This study aimed to assess the lipid profiles in Sudanese pregnant women.

Material and Methods:

This was a hospital-based case-control cross-sectional study. One hundred and fifteen normal pregnant women, with mean age 29. 74±6. 54 yrs; and 35 healthy non-pregnant women aged 26. 84±5. 29 were recruited. This study was conducted in Wad Madani Police Hospital at Gezira State in Central Sudan. The study was carried out during July 2011 to December 2011. This study included 115 pregnant women during normal gestation and 35 volunteers, apparently healthy non pregnant women served as control. The women were all in the reproductive age. All subjects were advised to fast overnight for a minimum of 8⁄12 hrs, and 5ml of fasting venous blood was collected from the antecubital vein under aseptic precaution from each subject in into plain bottles, separated by centrifugation at 4000 RPM for 7 minutes, kept in cryo-tubes and stored at -20 Cº till estimation of lipid profiles All study subjects had been informed by with the study objectives and had given written consents. A questionnaire was designed to obtain

personal information informations and data about age, gestational age, clinical picture and laboratory investigations. The lipid profile of the study groups was analyzed using the enzymatic colorimetric method as described by Biosystems.

Inclusion Criteria:

Willing pregnant women with normal uncomplicated pregnancy were included in this study.

Exclusion Criteria:

Patients with hypertension, diabetes, heart diseases, as well as those unwilling to participate were excluded from this study.

Reagents:

All chemical reagents used in this study were purchased from the (Biosystems S. A,)

Statistical analysis:

All measured variables for the study groups were presented as mean ± standard deviation, and used to compare between different study groups. All data were was analyzed by Graphpad prism4. Student t-test was used for comparison of means and $P < 0.05$ was considered to be statistically significant.

Results:

Table 1: Lipid profiles in pregnant women& controls. (levels in mg⁄dl)

p-value

Pregnant women

Control subjects

Variable

0. 75340. 7189

0. 0004

0. 0001

160. 90±27. 12146. 6±70. 9970. 59± 24. 4845. 46 ± 16. 94159. 00 ± 38.

63151. 20 ± 46. 8554. 69 ± 15. 1860. 03 ± 5. 914TCTGLDL-cHDL-c

Table 2: Serum (TC), (HDL-c), (LDL-C), (TG) levels in controls and pregnant women according to 3 trimesters (mean± standard deviation)

Parameter

Controls

1st trimester

2nd trimester

3rd trimester

p-value

TC159. 00 ± 38. 63141. 00± 21. 95*162. 50 ± 24. 01170. 10 ± 26. 23

0. 0004

TGs151. 20 ± 46. 85100. 40± 56. 84*136. 80 ± 58. 35175. 90 ± 70. 93

0. 0001

HDL-c60. 03 ± 5. 91444. 64 ± 9. 49*58. 84 ±19. 2738. 09 ±13. 64*

0. 0001

LDL-c54. 69 ± 15. 1861. 79 ±17. 0167. 94 ± 23. 35*76. 62 ± 26. 95*

0. 0014

* Indicates significant difference between means of the pregnant women according to the trimesters and controls.

Discussion:

Some authors observed that the concentrations of lipids and lipoproteins in the serum increased appreciably during pregnancy (Mankuta, et al, 2010). Another study showed that lipid levels were affected by maternal hormonal changes (rise in insulin, progesterone, 17-β estradiol and human placental lactogen) (Alvarez, et al, 1996). It was reported that during normal pregnancy all lipid fractions increased in parallel to the increase in pregnancy age and this increase was reported to be secondary to the increase in estrogen and progesterone levels during gestation (Cengiz, et al, 1997; Chapman, et al, 1996). In this study no significant change in serum TC level among pregnant women was observed (160. 90±27. 12) compared with controls (159. 00 ± 38. 63), p= 0. 7534. TC: An average increase compared with controls. Similar finding was found in a study conducted in India which showed no significant increase in total cholesterol during

gestation (Shalini, et al, 2011). In contrast, Tranquilli and his team showed a significant increase in TC in a group of Italian pregnant women (Tranquilli, et al, 2003). Different findings documented by Okojie and Blessing who investigated the serum lipid profile in Nigerian pregnant women and showed that total cholesterol level during the first, second and third trimesters when compared with that of the control subjects was significantly higher high (Okojie and Blessing, 2011). In contrast, TC level was found to be increased progressively with gestational age with significantly higher values during the second and third trimester of gestation (Munoz, et al, 1999). This study also showed no significant change in TGs level in pregnant women (146. 60±70. 99) compared with controls (151. 20 ± 46. 85), p= 0. 7189. TGs level showed a significant decrease during first trimester (100. 40± 56. 84); furthermore, it increased but non significantly lower during second trimester (136. 80 ± 58. 35) and finally increased during the third trimester (175. 90 ± 70. 93). A different finding was reported by Munoz and his team who reported increasing triglyceride level during first trimester with significantly higher values during second and third trimester of gestation in a study carried out in Indian pregnant women (Munoz, et al, 1999). Finding in this study also disagreed with another study conducted by Okojie and Blessing in a group of Nigerian pregnant women who showed an increase serum triglyceride level with increasing gestational age (Okojie and Blessing, 2011). Furthermore, this study showed a significant increase in LDL-c level with gestational age (first trimester 61. 79 ±17. 01, second trimester 67. 94 ± 23. 35, third trimester 76. 62 ± 26. 95) compared with the control (54. 69 ± 15. 18), p = 0. 0004. This finding is in agreement with Mankuta and his

colleagues who reported similar results with an average increase of approximately 23% in the third trimester (Mankuta, et al, 2010). It was also found to be somewhat in line with the results of Okojie and Blessing which showed that LDL-c was not significantly higher high in the first trimester but became significant in the second and third trimester compared with the controls (Okojie and Blessing, 2011). In this study a significant decrease in HDL-c level in pregnant women was found (45. 46 ± 16. 94) compared with controls (60. 03 ± 5. 914), p= 0. 0001. HDL-c level showed an average decrease with gestation age (first trimester 44. 64 ± 9. 492, second trimester 58. 84 ±19. 27, third trimester 38. 09 ±13. 64). This finding was in line with the study carried out by Desoye and his group, in which they found a decrease in HDl-c level during weeks 22 to 24 of gestation which accompanied with the onset of increasing resistance to insulin and the increase in concentration of plasma insulin (Desoye, et al, 1987). In contrast, Okojie and Blessing study showed an increase in the level of HDL-c in normal pregnant women with increasing gestational age when compared with controls (Okojie and Blessing, 2011). It was also dissimilar with the results of Mankuta et al who reported no significant change in HDL-c level during the first trimester; the second trimester was characterized by an increase of high density lipoprotein cholesterol level and by a decrease during the third trimester (Mankuta, et al, 2010).

Conclusion

According to the findings of the study, the Sudanese normal pregnant women were found to have significant changes in lipid profiles when compared to Sudanese normal non pregnant control group. There was a

significant increase in LDL-c level accompanied by lowering HDL-c level during pregnancy. TGs and TC levels were not affected significantly by pregnancy. The effect of pregnancy on rising LDL-c and lowering HDL-c levels may act as a risk factor of developing cardiovascular disease.