Effect of Two Supplements on Gestational Hypertriglyceridemia: Report of Two Cases

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Hypertriglyceridemia (HTG) during pregnancy is a well-known condition as an indirect result of physiologic changes in sexual hormones. Increase in TG level is caused by 2 major reasons. First, increase in liver lipase enzyme activity, which results in increase of TG synthesis in liver; second, reduction in lipoprotein lipase activity, which by itself results in the reduction of fat tissue catabolism (1). High concentration of TG in mother provides enough substrate for fetus metabolism, when the blood glucose level is low. In addition, high concentration of low-density lipoprotein (LDL) helps steroidogenesis of placenta (2). HTG could be hereditary or acquired. Obesity, diabetes, pregnancy, nephrotic syndrome, and hypothyroidism can induce acquired HTG (2, 3). This metabolic disturbance has an important role in atherosclerosis (2). Moreover, it can increase cardiovascular events as well as increase in insulin resistance, coagulopathy, and endothelial damage. Acute pancreatitis is a complication of HTG (2, 4). Pregnant females with the history of metabolic disorders are more prone to develop acute pancreatitis during pregnancy because of HTG (1, 5). Proper management of HTG during pregnancy is still under consideration (6). The management of 2 patients with gestational HTG in the 28th and 22nd weeks of gestation and their pregnancy outcomes were discussed here. The first clue in the diagnosis of the first case was the milky appearance of blood sample, obtained for the gestational diabetes screening test. In the 2nd case nausea, vomiting, and epigastric pain were the signs.

1. Introduction

Hypertriglyceridemia (HTG) during pregnancy is a well-known condition as an indirect result of physiologic changes in sexual hormones. Increase in TG level is caused by 2 major reasons. First, increase in liver lipase enzyme activity, which results in increase of TG synthesis in liver; second, reduction in lipoprotein lipase activity, which by itself results in the reduction of fat tissue catabolism (1). High concentration of TG in mother provides enough substrate for fetus metabolism, when the blood glucose level is low. In addition, high concentration of low-density lipoprotein (LDL) helps steroidogenesis of placenta (2). HTG could be hereditary or acquired. Obesity, diabetes, pregnancy, nephrotic syndrome, and hypothyroidism can induce acquired HTG (2, 3). This metabolic disturbance has an important role in atherosclerosis (2). Moreover, it can increase cardiovascular events as well as increase in insulin resistance, coagulopathy, and endothelial damage. Acute pancreatitis is a complication of HTG (2, 4). Pregnant females with the history of metabolic disorders are more prone to develop acute pancreatitis during pregnancy because of HTG (1, 5). Proper management of HTG during pregnancy is still under consideration (6). The management of 2 patients with gestational HTG in the 28th and 22nd weeks of gestation and their pregnancy outcomes were discussed here. The first clue in the diagnosis of the first case was the milky appearance of blood sample, obtained for the gestational diabetes screening test. In the 2nd case nausea, vomiting, and epigastric pain were the signs.

2. Case Presentation

The 1st patient is a-29-year-old pregnant female G2L1 at the 28th week of gestation with a monochorionic-diamniotic twin pregnancy. The patient was referred to the clinic because of impaired glucose tolerance test (GTT) and abnormal lipid profile. During pregnancy screening, a milky blood sample raised suspicion on abnormal lipid profile. The patient had a history of HTG (400 mg/dL), diagnosed 2 years ago. Nevertheless, the patient was not...
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Hyperlipidemia is a common condition resulted from changes in lipids metabolism in late pregnancy. Pregnancy is a unique cause of acquired HTG (1-3), because serum TG, Chol, very low-density lipoprotein (VLDL), and high-density lipoprotein (HDL) levels are higher in the 3rd trimester of gestation in comparison to non-pregnant females (3). The relative deficiency of lipoprotein lipase (LPL) and dysbetalipoproteinemia can cause severe gestational hyperlipidemia. Deficiency of LPL also results in hyperlipidemia. However, patients with relative LPL deficiency have normal lipid profile. Their disease remains undiagnosed until a major stress, such as pregnancy (7).

Dyslipidemia usually occurs during the 3rd trimester of pregnancy and TG concentrations higher than 1000 mg/dL is observed in the cases with sever hyperlipidemia (1, 2). Pancreatitis may also develop in patients with lower TG levels, such as the current study cases who developed pancreatitis with TG levels lower than 1000 mg/dL. Diabetes is a secondary cause of disturbances in lipid metabolism and is usually accompanied by rises in VLDL and TG levels (8). In the current report, both patients had gestational or overt diabetes. Increased concentration of plasma TG is related to blood glucose level in diabetes. Therefore, control and appropriate adjustment of blood glucose in diabetic patients is reported as a goal for HTG treatment (2, 5).

There are various treatment options available to treat HTG (2). Fibrate compounds such as gemfibrozil (300 mg twice daily) are used in sever HTG cases and can lower TG levels (2, 8, 9). Daily fish oil can decrease both TG and VLDL levels and can also be used as a supplement during pregnancy (2, 10, 11). Daily therapeutic dosage of omega-3 fatty acid varies from 2.7 to 18 g/d during pregnancy (11). However, it is believed that excessive amount of omega-3 fatty acid does not affect the progressive gestational HTG (11). Takaishi et al., concluded that omega-3 fatty acids and diet therapy may play a protective role in the cases with HTG in pregnancy (11). Tracer kinetic studies showed that omega-3 fatty acids reduces the production of VLDL-TG and increases TG clearance. In addition, fish oil increases β-oxidation in adipose tissue and also increases fatty acid uptake, and reduces VLDL synthesis (12). Some studies expressed doubts about advantages of using fibrate compounds in pregnancy, due to the scarcity of available evidence regarding the safety of fibrate administration in
pregnancy (7, 13, 14). However, both cases in the current study were informed about the possible complications; they agreed to take the medication and successfully responded to it.

Coelitisiasis is a common predisposing factor of HTG condition in pregnancy and occurs in 1:3300 cases (5). Pancreatitis is not a common medical condition in pregnancy. Although mortality from pancreatitis in pregnancy has dropped in recent years, it is still a concern both for mother and fetus’ health (1, 4). Pancreatitis symptoms are non-specific during pregnancy, but epigastric pain, nausea, and vomiting are observed in most cases (1). Lotfalizadeh et al., reported a case of hypertriglyceridemic pancreatitis in a pregnant female presented with hypertension and hyperlipidemia. Their patient took gemfibrozil (300 mg 3 times daily) before admission. During hospitalization, gemfibrozil was replaced by fish oil. They successfully controlled pancreatitis and HTG; however, the intrauterine fetal death occurred. Later, they started fish oil and gemfibrozil to decrease serum TG level and the patient was discharged in good condition with TG level lower than 200 mg/dL (15).

Pancreatitis is diagnosed by the detection of increased serum amylase and/or lipase activity. Imaging modalities, such as abdominal ultrasonography, do not confirm the diagnosis, but can be useful to detect some causes of pancreatitis such as gallstones (1). Although the current study cases had normal serum calcium level and normal abdominual sonography without gallstones, abnormal lipid profile was considered as the reason of pancreatitis (1). Treatment was similar to non-pregnant females, based on pain relief, adequate hydration, restriction of oral intake, and low fat diet (1).

3.1. Conclusion

In the pregnant females with abnormal lipid profile, the 1st step is to consider severe conditions such as pancreatitis. After ruling out such important differential diagnoses, establishing prompt medical treatment and adequate control of comorbid conditions including diabetes is essential. Although different pharmaceutical therapies of HTG in pregnant females are controversial, in the present report the patients with gestational HTG successfully responded to treatment with gemfibrozil and fish oil. It is recommended to prescribe these supplements as an adjuvant to diet therapy in such patients.

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