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Case report

Omega-3 fatty acids for the treatment of hypertriglyceridemia during the second trimester

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ABSTRACT

Objective: Serum triacylglycerol (TG) levels increase during pregnancy. High serum TG levels may elicit acute pancreatitis; therefore, it is important that pregnant women are managed well to abrogate the rapid rise of TG levels in pregnancy. The aim of this study was to report on the effect of eicosapentaenoic acid administration on pregnant women with hypertriacylglycerolemia in the second trimester.
Method: We report on four patients who presented to Kumamoto University Hospital from January 2005 to March 2013.
Findings: All four patients delivered neonates at term without complicating acute pancreatitis. Additionally, in three cases of multipara, the maximum serum TG levels were decreased to 10% to 49% of their preceding pregnancy.
Conclusion: Oral eicosapentaenoic acid administration might be a safe and useful treatment for hypertriacylglycerolemia during pregnancy and may prevent the development of acute pancreatitis.

Introduction

Maternal serum triacylglycerol (TG) levels increase two to four times during normal pregnancy [1], but levels rarely exceed 300 mg/dL [2]. Unlike common complications of chronic hypertriacylglycerolemia (HTG), such as arterial sclerosis or coronary artery disease [3], acute HTG may cause acute pancreatitis [4]. Pancreatitis can develop in pregnant women and is a life-threatening complication that can be prevented by controlling serum TG levels [5]. However, most medications for treating HTG are not safe for use during pregnancy; therefore, dietary intervention often is the only option in such cases. Following our first case of a pregnant woman who was administered eicosapentaenoic acid (EPA) for HTG [6], we experienced three more cases and are now convinced of the efficacy and safety of EPA. Here, we report four cases of HTG in pregnant women treated with eicosapentaenoic acid (EPA) during pregnancy, along with a review of the current literature.

Case reports

Case 1

We have previously reported on a 27 y old (gravida 2, para 1) woman as the first woman who was administered EPA for HTG during pregnancy in Kumamoto University Hospital (see previous report [6] and Table 1).

Case 2

A 37 y old (gravida 2, para 1) woman had undergone laparoscopic surgery for an ovarian tumor when she was 33 y old. A close relative had past history of HTG and acute pancreatitis. Although her serum TG level was increased (417 mg/dL), her total cholesterol and Apo protein levels were normal at her preoperative examination. Therefore, she was diagnosed as type I or V HTG and received dietary intervention (Table 1, Fig. 1). One y later, she had her first pregnancy and received prenatal care at our hospital. Her serum TG levels had gradually increased and reached 4020 mg/dL; she was started on dietary intervention at 34 wk and 3 d of gestation. She had a spontaneous delivery at

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41 wk and 1 d of gestation. Her serum TG levels rapidly decreased to normal levels (217 mg/dL) 4 wk after parturition. Three years later, she had her second pregnancy. As gestation progressed, her serum TG levels increased. At 18 wk and 4 d of gestation, oral EPA was initiated at 1800 mg/d and its dosage was increased to 4500 mg/d. Peak serum TG levels during her second pregnancy reached 1979 mg/dL at 40 wk of gestation, and decreased to 49% of her preceding pregnancy. She gave birth naturally at 41 wk and 1 d of gestation.

Case 3

A 30 y old (gravid 2, para 0) woman (Table 1) had been managed in the hospital's Department of Gastroenterology for Crohn's disease. Although her physician was aware that the patient's serum TG levels were at the upper limit of normal, she did not order further examination of HTG because serial blood examination did not reveal any additional increases in the TG level. The patient became pregnant after intracytoplasmic sperm injection at a local clinic. At 12 wk and 6 d of gestation, she was referred to our hospital for the management of her pregnancy. Her serum TG levels were 182 mg/dL at her first visit but increased to 620 mg/dL at 23 wk and 6 d of gestation. Despite dietary restrictions for 3 wk, TG levels remained abnormally high. Oral EPA administration (600 mg/d) was therefore started at 26 wk of gestation. Her serum TG levels remained at ~300 mg/dL without any complications. She delivered her baby after an oxytocin-induced labor at 38 wk and 5 d of gestation.

Case 4

A 31 y old (gravida 2, para 1) woman was transferred to our hospital for treatment of acute pancreatitis at 26 wk and 6 d of her first pregnancy (Table 1, Fig. 1). Her serum TG (11 480 mg/dL), total cholesterol (1172 mg/dL), and pancreatic amylase (416 U/L) levels were increased significantly on admission. Additionally, her father had past history of HTG and acute pancreatitis and she was diagnosed as type V HTG. Her symptoms improved after medication and she underwent a cesarean delivery at 30 wk and 1 d of gestation to prevent possible secondary infection of a pancreatic cyst. She had a favorable postoperative course and was discharged on postoperative day 28. Details of her first pregnancy were reported in a study published by her gastroenterologists [7]. Her serum TG levels were maintained in the normal range by dietary intervention. Two years later, she had a second pregnancy. Her serum TG levels gradually increased to 342 mg/dL; therefore, EPA administration at 600 mg/d was initiated from 15 wk and 6 d of gestation and its dosage was titrated up to 2700 mg/d according to her serum TG levels. The maximum serum TG levels of her second pregnancy reached 1163 mg/dL at 27 wk and 6 d of gestation, but there were no findings of acute pancreatitis. She had a vaginal birth after cesarean delivery at 39 wk and 3 d of gestation. Her serum TG levels were normal 1 mo after delivery and she no longer required any medication.

Discussion

Cases 1, 2, and 4 were multiparous and had been diagnosed with HTG during antecedent pregnancies. Cases 1 and 4 had been complicated with acute pancreatitis in the previous pregnancies. Case 3 was a primigravida who had a high serum TG level detected before pregnancy. For cases 1 and 4, the

Table 1
Clinical features of each case

	Age	G-P		Acute pancreatitis	Serum TG level in first trimester (Mg/dL)	Serum TG level at EPA start (Mg/dL)	Maximum of serum TG level (Mg/dL)	Delivered gestational week	Type of delivery	Birth weight (g)	Intrapartum hemorrhage (g)	Postpartum serum TG level (Mg/dL)	Diagnosis of HTG	Familial history
Case 1	27	2-1	Preceding pregnancy (2 y ago) EPA (−)	Yes (35 wk 2 d)	-	Unused	12,020 (35 wk 2 d)	38 wk 5 d	NTVD	2,895	540	165	Type V	Father:HL (no treatment, detail is unknown)
			Present	No	72	782 (27 wk 2 d)	1,691 (33 wk 2 d)	37 wk 0 d	NTVD	2,635	230	383		
Case 2	37	2-1	Preceding pregnancy (3 y ago) EPA (−)	No	319	Unused	4,020 (34 wk 3 d)	41 w1 d	NTVD	3,715	650	217	Type I or V	Close relative:HTG, acute pancreatitis
			Present	No	131	531 (18 wk 4 d)	1,979 (40 wk 0 d)	41 wk 1 d	NTVD	3,950	580	358		
Case 3	30	2-0	Present	No	182	336 (26 wk 6 d)	620 (23 wk 6 d)	38 wk 5 d	Oxytocin	3,365	490	113	Un-known	-
Case 4	31	2-1	Preceding pregnancy (2 y ago) EPA (−)	Yes (26 wk 6 d)	-	Unused	11,480 (26 wk 6 d)	30 wk 1 d	C/S	1,679	627	222	Type V	Father:HTG, acute pancreatitis
			Present	No	408	342 (15 wk 6 d)	1,163 (27 wk 6 d)	39 wk 3 d	NTVD (VBAC)	3,575	500	48		

C/S, cesarean section; EPA, eicosapentaenoic acid; G-P, gravida-para; HL, hyperlipidemia; HTG, hypertriacylglycerolemia; NTVD, normal transvaginal delivery; TG, triacylglycerol; VBAC, vaginal birth after cesarean