Case Report

Pseudohypertriglyceridemia from Oral Glycerine

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A 74 year-old Thai woman was found to have hypertriglyceridemia possibly due to an increased blood glycerol level. Her previous serum triglyceride (TG) levels were 65 and 99 mg/dl. After 2 months of taking glycerine at a dose of 50 ml orally every 8 to 12 hours for treatment of glaucoma, her serum TG concentrations increased from 77 to 1,815 and 2,693 mg/dl, but decreased rapidly to 72 and 59 mg/dl on days 3 and 6 following withdrawal of glycerine treatment. There were no other causes of hypertriglyceridemia. High blood glycerol level can interfere with enzymatic methods commonly used in the measurement of TG in most laboratories and result in falsely elevated levels of TG.

Keywords: *Pseudohypertriglyceridemia, Glycerine, Glaucoma*

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Pseudohypertriglyceridemia is defined as the presence of falsely high level of serum triglyceride due to excess glycerol in blood. Hyperglycerolemia interferes with triglyceride measurement using enzymatic method resulting in false elevation of serum triglyceride level. In previous reports, this condition was found in patients with glycerol kinase deficiency[1-6]. There has been no reported case of oral glycerine intake inducing pseudohypertriglyceridemia.

Case Report

A 74-year-old woman was admitted to Siriraj Hospital in the Department of Ophthalmology for enucleation of her left eye and was consulted for evaluation of hypertriglyceridemia. She had a history of chronic glaucoma for 6 years. Two months before this admission, she developed a severe corneal ulcer on her left eye which had been treated with oral glycerine at the dose of 50 ml every 12 hours. Her recent medications also included itraconazole and ophthalmic cyclosporine. Her other medical disorders were hypertension, hypercholesterolemia, coronary heart disease, and asthma. She had been receiving amlodipine, simvastatin, isosorbide-5-mononitrate, montelukast Na and salmeterol + fluticasone propionate accuhaler. Physical examination revealed no xanthoma or lipemia retinalis There was no thyroid enlargement. The rest of the examination was not significant.

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Her last fasting serum triglyceride (TG) level before admission in February 2006 was 77 mg/dl and her fasting serum TG, high- and low-density lipoprotein (HDL and LDL) and fasting blood glucose (FBG) concentrations during the past 20 months are shown in Table 1.

During the period of two months (from 1 August to 23 September 2006), she received 50 ml of oral glycerine, every 12 hours for treatment of glaucoma. On September 24, 2006 after admission to Siriraj Hospital, glycerine therapy was increased to a dose of 50 ml every 8 hours. Her fasting serum triglyceride level rapidly increased from 784 mg/dl at admission to 1,815 and 2,693 mg/dl on the next day and the day after, respectively. Fenofibrate was started on the

Table 1. Chronological results of serum lipids and glucose profiles

Profiles	May 2004	Aug 2004	Oct 2004	Feb 2006
FBG (mg/dl)	95	94	89	102
Cholesterol (mg/dl)	175	173	204	171
HDL (mg/dl)	82	-	68	-
LDL (mg/dl)	66	183	123	-
TG (mg/dl)	102	65	96	77

second day after admission but was discontinued two days later after taking only one dose. Glycerine was discontinued on the second day after admission resulting in a rapid decrease in fasting serum triglyceride levels to 72 and 59 mg/dl on the fifth day and the eighth day after admission, respectively.

Discussion

Since there were no other possible causes which might explain the increased triglyceride level in this patient, she was diagnosed as having pseudohypertriglyceridemia. However, pseudohypertriglyceridemia in previous reports were found in persons with glycerol kinase deficiency[1-6] and in subjects receiving parenteral nutrition containing glycerol (Intralipid, Liposyn)[7] or oral expectorant (iodinated glycerol)[8]. There has been no previous report of pseudohypertriglyceridemia associated with ingestion of oral glycerine.

Oral glycerine used in the present study hospital has a strength of 98% which means that 100 ml of this solution contains 98 g of glycerol. Ingestion of glycerol was well absorbed and appeared in the blood interfering with serum triglyceride assay[9]. Triglyceride level is now commonly measured with enzymatic methods[10] directly from plasma or serum. The enzyme reagents and reactions are shown in Fig. 1[1]. The usual procedure for triglyceride measurement will take all steps (1-4) combined, but glycerol measurement was obtained by a procedure using only steps 2, 3 and 4. Accordingly, the "true triglyceride level" can be calculated by subtracting the results of the second procedure from the first one. This method is called "Triglyceride blank[10]". Triglyceride blanking is usually practiced only by research laboratories and those supporting lipid clinics. In Bangkok, there are only a few hospitals where triglyceride blank technique is used in triglyceride measurement, exclusive Siriraj Hospital. Thus, in this patient the authors could not measure triglyceride blanking to obtain true triglyceride level.

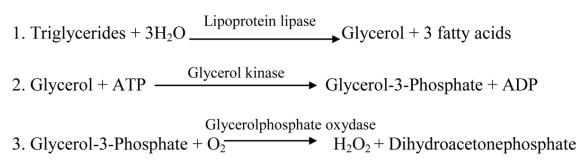

Fig. 1 Measurement of plasma triglyceride level by enzymatic colorimetric assay

The authors thought that she had pseudohypertriglyceridemia since other causes of hypertriglyceridemia were already excluded and the increase and decrease in serum triglyceride levels were paralleled to the ingestion and withdrawal of glycerine. After stopping oral glycerine treatment, the authors found that the triglyceride levels were dramatically decreased to a normal range.

The present report shows that pseudohypertriglyceridemia could be induced by oral intake of glycerine. This abnormality in the laboratory result is not clinically harmful and glycerol itself does not produce abnormal lipid metabolism. Awareness of this "pseudohypertriglyceridemia", as an abnormal laboratory result without clinical importance, may help clinicians to avoid using therapeutic medication to correct it.

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ภาวะไตรกลีเซอร์ไรด์ในเลือดสูงลวง จากการกินกลีเซอรีน

วรณัน เจริญหิรัญยิ่งยศ, สาธิต วรรณแสง

ผู้ป่วยหญิงไทยอายุ 74 ปี มีภาวะไตรกลีเซอร์ไรด์ในเลือดสูงจากการเพิ่มขึ้นของระดับกลีเซอรอลในเลือด ระดับไตรกลีเซอร์ไรด์ของผู้ป่วยก่อนหน้านี้ เท่ากับ 65 และ 99 มก./ดล. และหลังจากได้รับการรักษาต้อหิน ด้วยการกินกลีเซอรีน 50 มล. ทุก 8-12 ชั่วโมง นาน 2 เดือน ระดับไตรกลีเซอร์ไรด์ในเลือดเพิ่มขึ้นจาก 77 เป็น 1,815 และ 2,693 มก./ดล. และหลังจากหยุดการรักษาด้วยกลีเซอรีนระดับไตรกลีเซอร์ไรด์ในเลือดลดลงเหลือ 72 และ 59 มก./ดล. ในวันที่ 3 และ 6 ตามลำดับ โดยปราศจากสาเหตุอื่นของไตรกลีเซอร์ไรด์ในเลือดสูง ระดับกลีเซอรอลในเลือดสูงสามารถรบกวนวิธีการวัดเอนไซม์ที่ใช้ในการวัดไตรกลีเซอร์ไรด์ในห้องปฏิบัติการส่วนใหญ่ และเป็นผลเทียมของระดับไตรกลีเซอร์ไรด์ที่สูงขึ้น