Dyslipidemia Among Healthy Postmenopausal Thai Women

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Abstract

A prospective analysis was conducted to assess the prevalence of dyslipidemia among 80 healthy postmenopausal Thai women who were not more than five years after menopause. Serum total cholesterol, triglycerides and high-density lipoprotein (HDL) cholesterol were measured using enzymatic procedures. Low-density lipoprotein (LDL) cholesterol concentration was estimated by Friedewald formula. The results showed that 91.25 per cent, 10.00 per cent, 38.75 per cent and 48.75 per cent of the studied population had total cholesterol $\geq$ 200 mg/dl, triglycerides $\geq$ 150 mg/dl, HDL < 50 mg/dl, and LDL $\geq$ 190 mg/dl respectively. Of all the women, 77.50 per cent and 10.00 per cent had total cholesterol / HDL ratio of $\geq$ 4 and had triglyceride levels of $\geq$ 150 mg/dl with HDL < 50 mg/dl, respectively. This unexpected high prevalence of dyslipidemia in this healthy postmenopausal group should be taken into account in considering health promotion strategies for postmenopausal Thai women particularly those in the high risk group.

Key word : Dyslipidemia, Postmenopause, Healthy Thai

In industrialized countries, over 50 per cent of postmenopausal women will die of cardiovascular disease[1]. Premenopausal women have a much lower incidence of cardiovascular mortality than men, but after menopause, their mortality exponentially rises to approach that of men[2]. Estrogens have been hypothesized to protect against atherosclerosis through lipid mechanism. The loss of estrogen at the menopause causes low-density lipoprotein (LDL) cholesterol to increase whilst high-density lipoprotein (HDL) cholesterol to decline[3]. The changes in lipid-lipoproteins have a strong causal role in the pathogenesis of coronary heart disease (CHD)[4-6]. In the past decades, Thai people have unavoidably been influenced by the effect of globalization. The changes in lifestyle to a more urba-

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nized pattern have potential adverse effects on cardiovascular incidence. We conducted a prospective analysis, therefore, to assess the prevalence of dyslipidemia among healthy postmenopausal women. We focussed on those who were in the first five years after menopause which is the period when women experience apparent changes in health status due to estrogen deficiency.

MATERIAL AND METHOD

This prospective analysis was conducted on 80 healthy postmenopausal women attending the menopause clinic, Chulalongkorn Hospital. Women were eligible to participate if their age ranged between 40-60 years, within one to five years after spontaneous menopause (serum estradiol level ≤100 pmol/L and FSH level ≥30 IU/L), had a body mass index between 19-30 kg/m^2 and had a normal electrocardiogram within the previous three months. Women were excluded if they had a history of any chronic medical illness, had taken hormones or drugs known to interfere with lipid metabolism within the previous six months, smoked, had regular alcohol consumption or drug addiction or abnormal results on tests of fasting plasma glucose or liver enzymes (SGOT and SGPT). The protocol was approved by the Ethics Committee of Chulalongkorn University Hospital. All the women gave written informed consent to participate in the study.

Blood was collected in the morning after a 12-hour fast. Serum obtained by centrifugation for lipid-lipoprotein measurement was analyzed within 24 hours. Serum total cholesterol levels were measured using an enzymatic colorimetric test with cholesterol esterase, cholesterol oxidase and 4-aminophenazone[7]. Triglyceride levels were measured using an enzymatic colorimetric test with glycerol phosphate oxidase and 4-aminophenazone[8]. High-density lipoprotein (HDL) cholesterol levels were measured after precipitated low-density lipoprotein (LDL) and very low-density lipoprotein (VLDL) cholesterol with phosphotungstic acid and magnesium chloride[9]. The LDL cholesterol concentration was estimated by the Friedewald formula[10]. [LDL cholesterol = total cholesterol - triglycerides/5-HDL cholesterol, mg/dl]. The reagents for lipid assays were cholesterol PAP for cholesterol assays, unimate 7 TRIG for the triglycerides and HDL reagent for LDL and VLDL precipitation. Control serum N (human) and P (human) used for quality control of the assays and an autoanalyzer COBAS MIRA S were from F. Hoffman, La Roche Ltd. Company. Diagnostic, Basel, Switzerland. The intra- and interassay coefficients of variation of the lipid assays were as follows; 2.9-4.7 per cent for total cholesterol, 3.3-5.4 per cent for triglycerides and 1.2-2.0 per cent for HDL cholesterol.

Data are given as mean ± standard deviation, range and percentage of prevalence. Descriptive statistics were carried out on the data where it was appropriate.

RESULTS

The characteristics of the studied population are shown in Table 1. The lipid-lipoprotein values including the ratio of total cholesterol / HDL are shown in Table 2. Fig. 1-2 demonstrate the prevalence of abnormal lipid-lipoprotein levels in these early postmenopausal women. Fig. 3 reveals 77.5 per cent of those who have total cholesterol / HDL ratio of ≥4 and 10.0 per cent of those who have triglycerides ≥150 mg/dl with HDL cholesterol < 50 mg/dl.

Table 1. Population characteristics (N=80).

Variables	Mean±SD	Range
Age (y)	51.6±3.3	44-60
Parity	1.9±1.5	0-6
Postmenopausal age (y)	49.3±3.2	42-59
Month since menopause	27.9±15.9	12-60
Body mass index (kg/m^2)	23.3±2.9	19.8-29.9
Systolic pressure (mmHg)	118.6±15.5	90.0-150.0
Diastolic pressure (mmHg)	75.5±8.8	60.0-100.0

Table 2. Mean lipid-lipoprotein value in early postmenopausal Thai women (N=80).

Variables	Mean±SD (mg/dl)	Range
Total cholesterol (TC)	259.0±40.2	162.0-348.0
HDL	54.1±10.5	31.9-77.7
LDL	184.4±37.6	93.4-260.5
Triglycerides	104.8±53.0	39.0-405.0
TC/HDL	4.9±1.1	3.0-8.6

HDL = high-density lipoprotein
LDL = low-density lipprotein

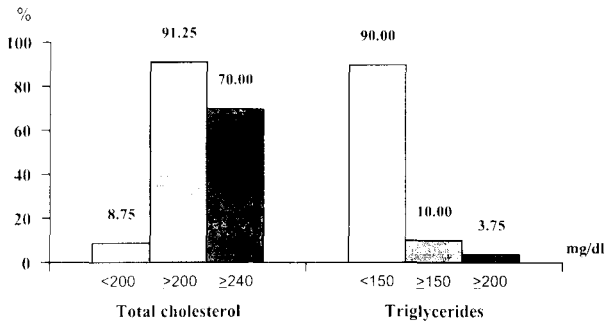

Fig. 1. Prevalence of abnormal total cholesterol and triglyceride levels in early postmenopausal Thai women (N=80).

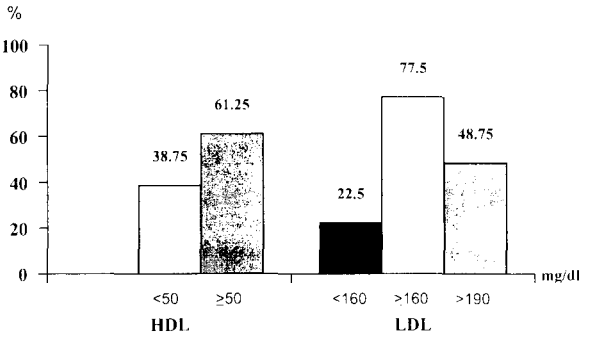

Fig. 2. Prevalence of abnormal HDL and LDL cholesterol level in early postmenopausal Thai women (N=80).

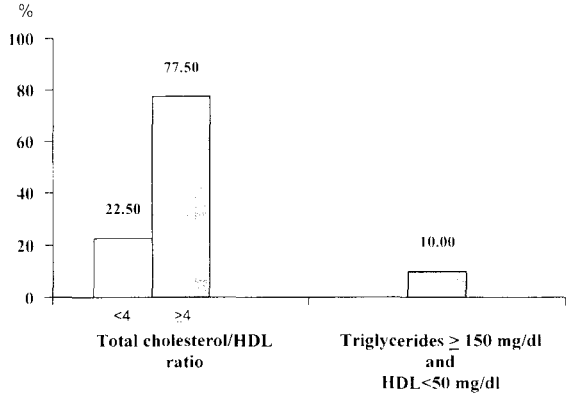

Fig. 3. Prevalence of early postmenopausal women who have total cholesterol / HDL ratio ≥4 and those who have triglycerides ≥150 mg/dl with HDL < 50 mg/dl. (N=80).

DISCUSSION

In 1993, the National Cholesterol Education Program (NCEP) developed guidelines showing that total cholesterol and LDL cholesterol levels that are considered to be high are ≥240 mg/dl and ≥190 mg/dl, respectively[11]. HDL cholesterol levels below 50 mg/dl were independently associated with a significant increased risk for coronary heart disease in women[12]. Women with triglyceride levels ≥150 mg/dl and HDL cholesterol levels < 50 mg/dl have a high risk of coronary heart disease[13]. Our study (Table 2) shows that the mean total cholesterol level in the studied population was above the normal range. The average LDL cholesterol, HDL cholesterol and triglycerides were well within the normal level. The mean ratio of total cholesterol / HDL was above the safety limit (<4)[14]. The percentage of those who have lipid-lipoprotein levels out of the normal range appeared to be sizeable (Fig. 1, 2). Fortunately, those who have triglyceride levels above the acceptable value seemed to be modest.

Hyperlipidemia is a powerful predictor of coronary disease. There is a strong, independent, continuous and graded positive association between total cholesterol levels and risk of coronary events [15]. However, it was found that 35 per cent of coronary heart disease occurs in people with total cholesterol less than 200 mg/dl[13]. Thus, it is essential to measure their lipoproteins i.e. HDL and LDL cholesterol. Individuals who have a total cholesterol level of less than 200 mg/dl but who have an HDL level of less than 40 mg/dl have the same high risk of coronary heart disease as individuals who have a total cholesterol level of 260 mg/dl[5]. LDL cholesterol levels are closely associated with incidence of coronary heart disease. The Lipid Research Clinics Trial showed that an 11 per cent decrease in LDL cholesterol levels reduced the incidence of coronary heart disease by 19 per cent[16]. However, unless LDL levels are very high (300 mg/dl or higher), they have no value, in isolation, in predicting those individuals at risk of coronary heart disease [14]. In the Framingham study, triglycerides con-

centration have been shown to be an independent risk factor for coronary heart disease[6]. The ratio of total cholesterol /HDL was also used in the Framingham Study which was found to give a better prediction of coronary heart disease than total cholesterol, LDL cholesterol, HDL cholesterol and triglycerides[14]. It has been recommended that if the total cholesterol level is $\geq$ 150 mg/dl , then the ratio of total cholesterol / HDL must be < 4. If the ratio is greater than 4, lipid-lipoprotein measurement must be made to determine whether the lipid problem is elevated triglyceride or LDL cholesterol levels[14]. Dietary modifications and exercise should be recommended otherwise lipid lowering drugs might be necessary.

This prospective analysis was conducted in healthy postmenopausal women who were within their first five years after menopause. There was no particularly significant risk for cardiovascular disease for instance, hypertension, cigarette smoking, diabetes, etc in this studied group. The unexpected high percentage of dyslipidemia in the sampling population which was supposed to be healthy, should be taken into account in considering the health promotion strategies on ageing women. It is a dreadful possibility to expect a larger proportion of high risk postmenopausal women to have abnormal lipid profiles.

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ไขมันที่ผิดปกติในสตรีไทยวัยหมดระดู

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ได้ทำการศึกษาชนิดวิเคราะห์ไปข้างหน้าเพื่อหาความชุกของระดับไขมันที่ผิดปกติในสตรีไทยวัยหมดระดู จำนวน 80 ราย สตรีกลุ่มดังกล่าวมีสุขภาพเป็นปกติหมดระดูมาไม่เกิน 5 ปี ได้ทำการตรวจวัดระดับ Total cholesterol, triglycerides และ High-density lipoprotein (HDL) cholesterol ด้วยกระบวนการวิเคราะห์ทางเอ็นไซม์ คำนวณหาระดับ Low-density lipoprotein (LDL) cholesterol ด้วยสูตรของ Friedewald ผลการศึกษาพบว่า ในกลุ่มประชากรที่ศึกษามีสตรีวัยหมดระดูที่มีระดับ Total cholesterol เท่ากับหรือมากกว่า 200 มก./ดล., ระดับ Triglycerides เท่ากับหรือมากกว่า 150 มก./ดล., ระดับ HDL น้อยกว่า 50 มก./ดล. และระดับ LDL เท่ากับ หรือมากกว่า 190 มก./ดล. ร้อยละ 91.25, 10.00, 38.75 และ 48.75 ตามลำดับ ในจำนวนสตรีที่ศึกษานี้พบว่า ร้อยละ 77.50 และ 10.00 มีอัตราส่วนของ Total cholesterol/HDL เท่ากับหรือมากกว่า 4 และมีระดับ Triglycerides เท่ากับหรือมากกว่า 150 มก./ดล. ร่วมกับระดับ HDL น้อยกว่า 50 มก./ดล. ตามลำดับ จากการศึกษานี้พบว่าความชุกของระดับไขมันที่ผิดปกติในประชากรกลุ่มที่ศึกษา มีสัดส่วนค่อนข้างสูง ทั้งที่เป็นกลุ่มสตรีวัยหมดระดูที่มีสุขภาพเป็นปกติ จึงสมควรนำมาเป็นข้อมูลที่ประกอบการพิจารณาหาแนวทางส่งเสริมสุขภาพในสตรีวัยดังกล่าว โดยเฉพาะอย่างยิ่งในกลุ่มที่มีความเสี่ยงสูงต่อการเกิดโรคหัวใจและหลอดเลือด

คำสำคัญ : ไขมันผิดปกติ, วัยหมดระดู, สตรีไทยสุขภาพปกติ

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