LAMPIRAN

Lampiran 1

Prosedur Pemeriksaan

1. Cara Pengambilan Darah Vena

a. Disiapkan alat – alatnya (kapas, alcohol, spuite disposable, tourniquet, tabung reaksi).

b. Di Cari dan ditentukan vena yang akan ditusuk.

c. Dibersihkan daerah yang akan diambil darahnya (vena fossa cubbiti), dengan alcohol 70 % dan dibiarkan sampai menjadi kering lagi.

d. Dipasang tournquet pada lengan atas dan meminta orang tersebut mengepal dan membuka tangannya berkali – kali agar vena terlihat jelas.

e. Diangkat kulit diatas vena itu dengan jari – jari tangan kiri supaya vena tidak dapat bergerak.

f. Ditusuk dengan jarum dan semprit tangan kanan sampai ujung jarum masuk kedalam lumen vena

g. Dilepaskan atau diregangkan toriquet, dan perlahan–lahan menarik penghisap semprit sampai jumlah darah yang dikehendaki di dapat yaitu: 3 ml

h. Dilepaskan torniquet yang terpasang.

i. Ditaruh kapas diatas jarum kemudian di cabut semprit dan jarum itu.

j. Diminta kepada orang yang darahnya diambil itu supaya tempat tusukan ditekan selama beberapa menit dengan kapas tadi.

k. Diangkat jarum dari spuit dan dialirkan (jangan disemprotkan) darah kedalam wadah atau tabung yang tersedia melalui dinding secara perlahan - lahan (tabung reaksi yang berisi antikoagulan NaF untuk pembuatan plasma sedang tabung yang lain tidak berisi antikoagulan untuk pembuatan serum).

2. Cara membuat Serum

a. Dimasukkan 2 ml darah kedalam wadah (tabung) yang bersih dan kering (tanpa antikoagulan) kemudian didiamkan selama 15 menit.

b. Kemudian di Centrifuge dengan kecepatan 3000 rpm selam 15 menit.

c. Lapisan jernih berwarna kuning muda yang berada di bagian atas adalah serum, segera diambil denga pipet tetes di masukan pada tabung lain yang bersih dan kering.

3. Pemeriksaan Profil Lipid

A. Pemeriksaan Kolesterol Total

Metode : "CHOD-PAP" test fotometric enzimatik.

Prinsip : Kolesterol ditentukan setelah hidrolisa enzimatik dan oksidasi. Indikator quinoneimine terbentuk dari hidrogen peroksida dan 4amioantipyrine dengan adanya phenol dan peroksidase.

Reaksi :

$$\text{Kolesterol ester} + H_2O \xrightarrow{\text{CHE}} \text{Kolesterol} + \text{as. Lemak}$$

$$\text{Kolesterol} + O_2 \xrightarrow{\text{CHO}} \text{Cholestene-3-one} + H_2O_2$$

$$2\,H_2O_2 + \text{PAP} + \text{Phenol} \xrightarrow{\text{POD}} \text{Quinonaimine} + 4H_2O$$

Alat : Tabung reaksi, rak tabung, mikropipet,tip, tissue, fotometer.

Reagen : Reagen kerja kolesterol.

Sampel : Serum/plasma

Cara kerja :

1) Disiapkan tabung reaksi bersih dan kering

2) Dipipet dengan mikropipet,masukkan dalam tabung reaksi:

	Blanko	Standar	Sampel
Standar	-	10 µl	-
Sampel	-	-	10 µl
Aquades	10 µl	-	-
Reagen	1000 µl	1000 µl	1000 µl

3) Campur dan inkubasi selama 10 menit pada suhu 20 – 25°C atau 5 menit pada suhu 37°C.

4) Baca pada fotometer dengan panjang gelombang 546 nm.

Nilai Normal : < 200 mg/dL

B. Pemeriksaan Kadar HDL Kolesterol

Metode : End Point

Tujuan : Mengetahui kadar HDL kolesterol dalam serum

Prinsip : Kilomikron, VLDL, dan LDL diendapkan dengan menambahkan asam phospotungstic dan ion magnesium untuk sampel. Setelah disentrifugasi hanya meninggalkan supernatan HDL. Kadar koleserol ditentukan menggunakan enzimatik kolesterol FS sehingga pada supernatant hanya tersisa HDL.

Alat : Tabung reaksi, Mikropipet, Tip, Tissue, Fotometer,

Bahan : Reagen presipitat

Cara kerja :

Presipitat

	Standar	Sampel
Standar	200 µL	-
Sampel	-	200 µL
Reagen presipitat	500 µL	500 µL

Homogenkan dan diinkubasi selam 15 menit pada suhu ruang, selanjutnya selama 20 menit 2500 rpm.

Pemeriksaan HDL

	Standar	Sampel
Precipitat		100 µL
Standar	100 µL	

Reagen kolesterol	1000 µL	1000 µL

Homogenkan dan inkubasi selama 10 menit dengan suhu ruang atau 5 menit dengan suhu 37°C. Kemudian ukur absorbansi dengan foto meter dalam 45 menit. Dengan panjang gelombang 546 nm.

Nilai Normal : 40 mg / dl atau lebih

C. Pemeriksaan Trigliserida

Metode : Colorimetric Enzimatik

Prinsip : Penentuan Trigliserida setelah pemisahan enzim dengan likoprotein lipase dengan quinonemine sebagai indikator yang dihasilkan dari 4-Aminoantipyrin dan 4-Cholophenol dan Hydrogen peroxide. Menurut reaksi katalitik dari enzim peroksidase.

Reaksi :

$$\text{Trigliserida} \xrightarrow{\text{Lipoprotein lipase (LPL)}} \text{Gliserol + as. Lemak}$$

$$\text{Gliserol + ATP} \xrightarrow{\text{Glicerokinase (GK)}} \text{Gliserol-3-fosfat + ADP}$$

$$\text{Gliserol-3-fosfat + } O_2 \xrightarrow{\text{Gliserol-3-fosfat-oksidase (GPO)}} \text{dihidroksiaseton fosfat +} H_2O_2$$

$$2H_2O_2 + \text{Aminoantipirin + 4-klorophenol} \xrightarrow{\text{Peroxidase (POD)}} \text{quinoneimine + HCl +} 4H_2O$$

Alat : Tabung reaksi, Centrifuge, Tip, Mikropipet, Waterbath, Tissue, Fotometer

Cara kerja :

	Blanko	Standar	Sampel
Standar	-	10 µl	-
Sampel	-	-	10 µl
Aquades	10 µl	-	-
Reagen	1000 µl	1000 µl	1000 µl

Inkubasi selama 10 menit pada suhu ruang dan dibaca pada fotometer dengan panjang gelombang 546 nm.

Nilai normal : < 150 mg/dl

D. Pemeriksaan LDL

Prinsip : Low Density Lipoprotein (LDL) diendapkan dengan penambahan heparin. High Density Lipoprotein (HDL) dan Very Low Density Lipoprotein (VLDL) tetap berada dalam supernatan setelah sentrifugasi dan diukur secara enzimatis dengan metode CHOD-PAP. Konsentrasi kolesterol LDL dihitung sebagai selisih kolesterol total dan kolesterol dalam supernatan.

Metode :Enzimatik fotometer CHOD PAP

Alat : Mikropipet, tip biru, tip kuning, tabung reaksi, rak tabung, sentrifuse, fotometer

Bahan : Serum ,Reagen kolesterol, reagen precipitat dan reagen standar

Cara kerja :

Presipitat

	Standar	Sampel
Standar	200 µL	-
Sampel	-	200 µL
Reagen presipitat	500 µL	500 µL

Homogenkan dan diinkubasi selam 15 menit pada suhu ruang, selanjutnya selama 20 menit 2500 rpm.

Pemeriksaan LDL

	Standar	Sampel
Precipitat		100 µL
Standar	100 µL	
Reagen kolesterol	1000 µL	1000 µL

Homogenkan dan inkubasi selama 10 menit dengan suhu ruang atau 5 menit dengan suhu 37°C. Kemudian ukur absorbansi dengan foto meter dalam 45 menit. Dengan panjang gelombang 546 nm.

Nilai Normal : 40 mg / dl atau lebih

Lampiran 2

KARTU KONSULTASI KTI

Nama Mahasiswa : Diyah Kesuma Dewi

Judul KTI : Gambaran Profil Lipid Pada Wanita Menopause (Studi Pustaka)

Pembimbing Utama : Sri Ujiani S.Pd., M.Biomed

No	Tanggal Bimbingan	Kegiatan	Paraf
1	07 - 01 - 2021	Perbaikan BAB I, II, III	
2	15 - 01 - 2021	Perbaikan BAB I, II, III	
3	20 - 01 - 2021	Perbaikan BAB I, II, III	
4	17 - 02 - 2021	Perbaikan BAB I, II, III	
5	20 - 02 - 2021	Perbaikan BAB I, II, III	
6	25 - 02 - 2021	ACC SEMPRO	
7	07 - 06 - 2021	ACC Perbaikan setelah SEMPRO	
8	08 - 06 - 2021	Perbaikan BAB IV, V	
9	09 - 06 - 2021	Perbaikan BAB IV, V	
10	10 - 06 - 2021	Perbaikan BAB IV, V	
11	11 - 06 - 2021	Perbaikan BAB IV, V	
12	18 - 06 - 2021	Perbaikan BAB IV, V	
13	21 - 07 - 2021	ACC SEMHAS	
14	03 - 08 - 2021	Perbaikan setelah SEMHAS	
15	06 - 08 - 2021	ACC CETAK	

Ketua Prodi TLM Program Diploma Tiga

MISBAHUL HUDA, M.Kes
NIP .196912221997032001

Lampiran 3

KARTU KONSULTASI KTI

Nama Mahasiswa : Diyah Kesuma Dewi

Judul KTI : Gambaran Profil Lipid pada Wanita Menopause (Studi Pustaka)

Pembimbing Pendampng : dr. Zulfian, Sp. PK

No	Tanggal Bimbingan	Kegiatan	Paraf
1	17 - 12 - 2020	Perbaikan BAB I, II, III	
2	8 - 01 - 2021	Perbaikan BAB I, II, III	
3	11 - 01 - 2021	Perbaikan BAB I, II, III	
4	12 - 01 - 2021	ACC	
5	26 - 04 - 2021	Acc Perbaikan Seminar Proposal	
6	24 - 05 - 2021	Perbaikan BAB IV, V	
7	21 - 06 - 2021	ACC SEMHAS	
8	05 - 08 - 2021	ACC CETAK	

Ketua Prodi TLM Program Diploma Tiga

MISBAHUL HUDA, M.Kes
NIP .196912221997032001

Dipindai dengan CamScanner

Lampiran 4

AJMS *Al*

Ameen J Med Sci (2011)4(3):221-228
(A US National Library of Medicine enlisted journal) *ISSN 097 4-11 43*
CODEN: AAJMB G

ORIGINAL ARTICLE

Effect of Menopause on Lipid Profile and Apolipoproteins

R.K. Swapnali[1*], Ravikiran Kisan[2] and D.S. Jayaprakash Murthy[3]

1 2
Department of Biochemistry SSIMS, Davangere, Karnataka India, Department of Physiology, SSIMS, Davangere, Karnataka, India and [3]Department of Biochemistry, JJMMC Davangere, Karnataka, India.

Abstract: Menopause is an estrogen deficient state. Natural menopause confers a threefold increase in Coronary Artery Disease (CAD) risk. This study was conducted to assess the effect of menopause on serum lipid profile and apolipoproteins. About 123 healthy subjects were studied (62 premenopausal and 61 postmenopausal women). Total Cholesterol (TC), Triglycerides (TG) and High Density Lipoprotein (HDL) were estimated by enzymatic method and Apo A-I and Apo B were estimated by immunoturbidimetric method by semi-autoanalyzer. TC, TG, Very Low Density Lipoprotein (VLDL), Low Density Lipoprotein (LDL), Apo B, TC/HDL and Apo B/Apo A-I were increased, whereas HDL and Apo A-I were decreased in postmenopausal women when compared to premenopausal women and were statistically significant ($p < 0.001$). Apo A-I and HDL cholesterol are antiatherogenic whereas Apo B and LDL cholesterol are atherogenic. The cholesterol content of HDL and LDL as an indicator for risk of CAD may be misleading because the cholesterol content varies with a variety of physiological and pathological conditions but not their protein content. Hence estimation of Apo A-I and Apo B, the protein part of HDL and LDL respectively serves as a more reliable tool in predicting the risk of CAD in postmenopausal women.
Key Words: Premenopausal women; Postmenopausal women; Apolipoproteins.

Introduction

Menopause is the permanent amenorrhea, which lasts atleast for a period of one year due to the cessation of ovarian function [1]. In young women, where estrogen production is high, serum lipids are normal but after menopause, lipid levels are increased and also the increased incidence of Coronary Artery Disease (CAD). This shows the possible relationship among estrogen, normal lipid profile and the relative immunity to CAD [2]. Hence after menopause, risk of atherosclerosis and CAD are more frequent [3]. Natural menopause confers a threefold increase in CAD risk [4]. Currently postmenopausal women account for

Lampiran 5

ORIGINAL ARTICLE

J Pub Health Med Res

LIPID PROFILE IN POSTMENOPAUSAL WOMEN OF HUBLI CITY

Madhavi D. Kulkarni [1], K.F. Kammar [2]

[1] Tutor, [2]Professor & HOD,

Department of Physiology, KIMS,HUBLI

[Received : 21/02/2014, Revised : 24/03/2014, Accepted : 18/04/2014]

Abstract :

Objective: The present study is aimed at comparing the levels of cholesterol in premenopausal with that of their postmenopausal women.

Materials And Methods: Investigations were carried out in 50 post menopausal healthy women aged 50 to 55 yrs., Fifty premenopausal healthy women aged 35-40yrs with height and weight matched as controls. Data were obtained via comprehensive questionnaire.

Results: There was statistically significant increase in Blood pressure, total cholesterol, LDL-C. No statistically significant change was seen in HDL-C, VLDL-C and Atherogenic Index compared to controls in this study.

Conclusion: Although natural menopause does not cause an immediate increase in heart disease, it does signal a period of increasing risk. It is probably related to both age and estrogen deficiency. Total cholesterol and LDL-C was increased in our study which has been attributed to hormonal changes and failure of follicular development. The plasma estradiol levels falls below the levels that is seen in premenopausal women. HDL-C and VLDL-C are not affected in our study because probably, these women were not sedentary workers and were non diabetic, non hypertensive and non obese.

Keywords: Lipid Profile, Post-menopausal, Coronary artery disease

Introduction:

Menopause is a natural event as the age advances and signifies the end of reproductive years with cessation of cyclic ovarian functions. It is heralded by menopausal transition, a period when the endocrine, biological and clinical features of approaching menopause begins[1].Lack of the protection of estrogen has been the major reason.

Lampiran 6

BJMHR

British Journal of Medical and Health Research

Journal home page: www.bjmhr.com

Assessment of Lipid Profile among Healthy Sudanese Post Menopausal Ladies

Sidahmed Yassin[1*], Gad Allah Modawe[2], AbdElkarim A. Abdrabo[1]

1. *Alneelain University Faculty of Medical Laboratory Sciences Department of chemical pathology, Khartoum, Sudan.*
2. *Omdurman Islamic University Faculty of medicine Department of biochemistry, Omdurman, Sudan.*

ABSTRACT

Several changes occurs in menopausal phase in women which may lead to changes in metabolism of lipids, protein and carbohydrates. The objective of this study was to assess the concentration of total serum lipid profile, in pre and post menopausal Sudanese women. This is descriptive case control study carried in Babanosawestkord of an .One hundred (100) apparently healthy, non pregnant females (40premenopausal and 60 post menopausal) were recruited for the study. Serum total cholesterol and the fractions- high-density lipoproteins (HDL), low-density lipoproteins (LDL), and triglycerides (TG) were estimated using enzymatic and established mathematical methods. The (mean±SD)of total Cholesterol, HDL, LDL and Triglyceride in post menopause respectively were (159.5±14.5, 62.6± 8, 79.1± 9.7, 104.6± 9.4).while The (mean SD)of total Cholesterol, HDL, LDL and Triglyceride in pre menopause Respectively were(137.2 ± 12.5, 84,8 ± 6,5,31.7± 8,5,103.4 ±7.3). The results showed that there was significant difference in the total serum cholesterol between the two groups. There was however, a significant reduction of HDL in the postmenopausal group (P value <0.005) and a significant increase in the level of LDL in the postmenopausal group (P value <0.005). The elevated LDL and the reduction of cardio protective HDL is an indication that menopause is an independent risk factor for developing

Lampiran 7

Original Article

Fasting Lipid Profile in Pre- and Post-Menopausal Women: A Prospective Study

Radhika Shenoy[1], Pradeep Vernekar[2]

[1]Assistant Professor, Department of Biochemistry, Srinivas Institute of Medical Sciences and Research Centre, Mangalore, Karnataka, India, [2]Associate Professor, Department of Medicine, Srinivas Institute of Medical Sciences and Research Centre, Mangalore, Karnataka, India

Abstract

Introduction and Aim: Menopause is a phase of woman's natural aging process and is marked by the cessation of ovarian function. The increased incidence of cardiovascular risk in the post-menopausal women may partly be due to hormonal changes leading to derangement of lipid metabolism. The present study is aimed at determining the degree of dyslipidemia in pre- and post-menopausal women.

Materials and Methods: This prospective study comprised 124 women, 47 pre-menopausal aged between 25 and 45 years and 77 post-menopausal aged between 55 and 70 years. Serum total cholesterol (TC), triglyceride (TG), high-density lipoprotein cholesterol (HDL-C) direct, low-density lipoprotein cholesterol (LDL-C), and very LDL-C (VLDL-C) were evaluated in both the groups and data were statistically analyzed using SPSS software version 16.

Results: In our study, we found significantly high levels of serum TC, serum TGs, serum LDL, and serum VLDL (234.77 ± 58.13 mg/dl, 156.86 ± 70.56 mg/dl, 146.49 ± 52.70 mg/dl, and 31.92 ± 13.76 mg/dl) in post-menopausal subjects when compared with pre-menopausal subjects (201.60 ± 48.50 mg/dl, 125.81 ± 69.96 mg/dl, 124.09 ± 42.71 mg/dl, and 25.28 ± 13.98 mg/dl). However, there was no statistically significant difference in the HDL-C fraction levels between the two groups.

Conclusion: Post-menopausal women are at increased risk of developing cardiovascular disease due to change in the lipid pattern and loss of cardioprotective effect of estrogen. Predicting the factors affecting the lipid profile in post-menopausal women, adopting strategies to control these mechanisms by modifying the relative risk factors during menopausal transition may improve the cardiovascular risk profile in these women.

Key words: Cholesterol, Lipid profile, Menopause

Lampiran 8

ISSN: 2320-5407 Int. J. Adv. Res. 5(6), 472-475

Journal Homepage: - www.journalijar.com
Corresponding Author:- Sivapriya. A.
Address**:-** Madurai Medical College, Madurai, Tamilnadu.
Article DOI: 10.21474/IJAR01/4435
DOI URL: http://dx.doi.org/10.21474/IJAR01/4435

RESEARCH ARTICLE

EFFECT OF DURATION OF MENOPAUSE ON SERUM LIPID PROFILE IN POSTMENOPAUSAL WOMEN

***Sivapriya. A and Santhanalakshmi. L.**
Madurai Medical College, Madurai, Tamilnadu.

…….....

Manuscript Info Abstract

…….. ……

Manuscript History
Received: 10 April 2017
Final Accepted: 12 May 2017
Published: June 2017
Key words:-
Cardiovascular disease, Lipid profile, Postmenopausal

Background: Female coronary heart disease morbidity rate accelerate after the age of 45years. Altered serum lipid profile seen in menopause is one of the major determinants for developing cardiovascular diseases. Changes in lipid level in relation to the duration of menopause is to be investigated to prevent the emerging cardiovascular diseases.
Aim and objective: To study the effect of duration of menopause on serum lipid profile in postmenopausal women.
Methods: After getting ethical committee approval, in this cross sectional study, postmenopausal women attending Government Rajaji Hospital for master health checkup were selected. Women with duration of menopause less than 10years (n=30) were taken as group-I and more than 10years (n=30) were taken as group-II and estimation of serum lipid profile was done for all of them.
Results: Statistical analysis was done by **student's t test** and the results were compared between group-I and group-II. In group-II, the mean values of total cholesterol ($p=0.006$) and low density lipoprotein levels ($p<0.001$) were increased significantly. However there was a significant decrease in high density lipoprotein level ($p< 0.001$).
Conclusion: The elevated low density lipoprotein and the reduction of high density lipoprotein level increases the risk of developing cardiovascular diseases. So specific health education strategies are needed in postmenopausal women of longer duration.
Copy Right, IJAR, 2017,. All rights reserved.

…….....

Introduction:-

Menopause is a normal physiological change wherein the permanent stoppage of menstruation takes place. Primarily menopause is due to loss of stocks of oocyte in the ovary with a consequent fall in the level of hormones like oestrogen and progesterone. Lipid metabolism is affected by the level of oestrogen. Altered serum lipid profile is associated with menopause and thus it is a major determining

Lampiran 9

A Comparative Study to Evaluate the Serum Lipid Profile in Pre and Postmenopausal Woman in Sulaymaniyah City _ Iraq

Fatma Mustafa Mohammad[1], Nihad AbdulJabbar Jalal[2] and Chateen I Ali Pambuk[1*]

[1]*College of Dentistry, University of Tikrit, Iraq*

[2]*Al-Qalam University College, Kirkuk, Iraq*

Received: August 09, 2017; **Published:** August 30, 2017

***Corresponding author :** Chateen I Ali Pambuk, College of Dentistrym, University of Tikrit, IraQ

Abstract

This study aims to measure the levels of fat in women before and after menopause, which is considered as an indicator to increase the likelihood of cardiovascular disease. This study included 210 Iraqi women before menopause, which ranged in age between (27-45), and 200 of postmenopausal women were between the ages of (51-67). Blood samples were collected for cholesterol measurement, triglycerides and high protein density and low protein density and low-density lipoprotein too. The results showed no significant differences in cholesterol TC level as the results of the study showed that there are statistically significant differences for triglycerides (TG) which reported results significantly increased (P <0.05) in postmenopausal women when compared to pre menopausal women in which the results were (145.97±39.64) (100.87 ±32.11) mg / dL, respectively. As for (HDL-C) there was a significant decrease (P <0.05) in postmenopausal women (34.41 ± 10.92) when compared with pre menopausal women (43.01 ± 14.29), as well as the case for (LDL-C) in which there was a statistically significant increase (P <0.05) with reported results (108.59±21.20) in postmenopausal women and (77.11 ± 30.36) in women before menopause. Regarding (VLDL-C) in postmenopausal women, the results recorded a significant increase (P <0.5) in terms of its percentage (32.93±8.44) when compared with women before menopause (21.31 ± 7.12). We conclude in this study, the presence of statistically significant changes in the proportions of fat, which is considered a risk factor for blood vessel and heart disease in Iraqi's women.

Lampiran 10

Comparative assessment of serum lipid profile levels between premenopausal and postmenopausal healthy woman- A case control study

B Sudhakar Babu[1], G Aparna[2*], C Niranjan Paul[3]

[1]Associate Professor, [3]Professor & HOD, Department of Community Medicine, Viswabharathi Medical College, R.T.Nagar, Penchikalapadu, Kurnool, INDIA.

[2]Associate Professor, Department of Obstetrics & Gynaecology, Government Medical College, Nizambad, INDIA.

Email: babusudhakar@gmail.com , aparnaganduri@gmail.com, paul_cn1952@gmail.com

Abstract Background: A comparative study of lipid profile levels between premenopausal and postmenopausal woman. Aims:

There is an increased incidence of cardiovascular risk in Post-menopausal woman due to hormonal changes causing changes in the serum lipid levels. The objective is to compare serum lipid profile levels between premenopausal women and postmenopausal women, as Cardiac diseases are common in post-menopausal women. Method: A total of 100 healthy subjects who comprised 50 premenopausal woman aged between 20-45 years and 50 post-menopausal woman aged between 46-65 years were selected. Ethical clearance was obtained from institutional Ethical committee and informed consent of each participant was obtained before start of the study. Blood samples were collected for the measurement of lipid profile levels. Student's unpaired T test was used for the statistical analysis. P values of < 0.05 were considered to be statistically significant. Results: The mean of serum total cholesterol was 187.54 mg/dl in test group and 171.98 mg/dl in control group with p value of <0.01. The mean of serum triglycerides was 160.36 mg/dl in test group and 117.7 mg/dl in control group with p value of <0.0001. The mean of serum LDL-C was 118.3mg/dl mg/dl in test group and 103.54 mg/dl in control group with p value of <0.003. The mean of serum VLDL-C was 118.3mg/dl in test group and 103.54 mg/dl in control group with p value of <1.48. The mean of serum HDL-C was 37.1mg/dl in test group and 42.14 mg/dl in control group with p value of <0.0001. Conclusions: This study concluded that serum level of HDL-C are significantly lower and serum TC, TG, LDL-C are significantly higher in post-menopausal woman compared to pre-menopausal woman. Key Words: Post-menopausal woman, Cardiovascular Diseases, Dyslipidemia,

[*]Address for Correspondence:

Dr G. Aparna, Associate professor, OBG, Government Medical College, Nizambad, INDIA.
Email: aparnaganduri@gmail.com

Received Date: 12/12/2019 Revised Date: 02/01/2019 Accepted Date: 15/01/2020

Lampiran 11

Biomedical & Pharmacology Journal, December 2019. Vol. **12**(4), p. 2037-2041

Assessment of Plasma Lipid Profile Among Sudanese Menopausal Women in Khartoum State-Sudan

Alneil Hamza[1]*, Moadah Abbas[2], Elyasa Elfaki[1], Mariam Ibrahim[2], Ezeldine K Abdalhabib[1] and Tarig Karar[3,4]

[1]Clinical Laboratory Sciences Department, College of Applied Medical Sciences, Jouf University, Qurayyat,77423.

[2]College of Clinical Laboratory Sciences, Sudan University of Science and Technology, Khartoum, 79371.

[3]Clinical Laboratory Sciences Department, College of Applied Medical Sciences, King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia.

[4]King Abdulla International Medical Research Centre, Riyadh, Saudi Arabia. *Corresponding Author E-mail: aahamza@ju.edu.sa

http://dx.doi.org/10.13005/bpj/1836

(Received: 16 October 2019; accepted: 29 November 2019)

Postmenopausal women tend to have significant changes in lipid profile when compared with premenopausal women. Incidence of cardiovascular disease after menopause believed to occur due to changes in the plasma lipid levels. This study was conducted to estimate and compare serum levels of total cholesterol(TC), triglycerides(TG), low-density lipoprotein cholesterol (LDL-c) and high-density lipoprotein cholesterol (HDL-c) among Sudanese pre and postmenopausal women. 94 participant women were enrolled in this cross-sectional study. 47 post-menopause women age 48 - 70 years and 47 pre-menopause women age 25-47 years. Estimation of serum lipid profile was carried out using Biosystems colorimetric methods and results statistics were computed by using SPSS. A significant increase in total cholesterol(TC), triglyceride, and LDL-c with a significant decrease in (HDL-c) level among postmenopausal women where found, when compared with pre-menopause women (P-value= <0.05). Total cholesterol and LDL-C level were observed significantly increased according to three interval time duration of menopausal onset (p=0.009 and p=0.034). A positive correlation was observed between the age of and total cholesterol levels in postmenopausal women (R=0.463, P-value =0.001)..

Lampiran 12

Estimation of Serum Lipid Profile among Pre and PostMenopausal Women in Baghdad City

Athraa Fouad Kadhuim

Middle Technical University, Institute of Medical Technology/Baghdad/ Nursing Department, Iraq

Abstract

This study aimed to determine the lipid profile concentration in the sera of women before and after the menopausal age in Baghdad city, since it is one of the main causes of cardiovascular diseases. The study included 100 women (40 premenopausal women with their ages ranged between (25-45 years) and 60 postmenopausal women with their ages ranged between (50-65 years). Blood samples were collected and total serum cholesterol (TC), S. triglycerides (TG), S. high density lipoprotein (HDL),S. low density lipoprotein (LDL) and S. very low density lipoprotein (VLDL) were measured. The results showed no significant difference ($P>0.05$) in the level of total cholesterol (TC) between the two groups of women, while there was a statistically significant increase ($P<0.05$) in the level of serum triglyceride (TG) in postmenopausal women (144.32±43.16) mg/dl when comparison with premenopausal women (101.92±32.44) mg/dl, and a significant decrease ($P<0.05$) in HDL level in postmenopausal women (33.56±10.65) mg/dl when compared with premenopausal women (43.13±14.23) mg/dl. The results of LDL level also showed a significant increase ($P<0.05$) in postmenopausal women (107.57±21.28) mg/dl when compared with premenopausal women (77.23±30.40) mg/dl, and a significant increase ($P<0.05$) in VLDL level in postmenopausal women (31.86±8.16) mg/dl when compared with premenopausal women (21.32±7.12) mg/dl.

Lampiran 13

Menopause: The Journal of The North American Menopause Society
Vol. 27, No. 7, pp. 000-000
DOI: 10.1097/GME.0000000000001532
2020 by The North American Menopause Society

ORIGINAL STUDY

Lipid profile changes during the menopausal transition

Veronica Inaraja, Sc Bch,[1] Israel Thuissard, Sc Bch,[1] Cristina Andreu-Vazquez, PhD,[1] and Esteban Jodar, MD, PhD[1,2]

Abstract

Objectives: There is evidence that the menopausal transition in women is accompanied by changes in the metabolic profile. We evaluated the lipid profile during the perimenopause to postmenopause transition and its association with menopausal status.

Methods: This is a retrospective observational study of laboratory studies from women presenting to the gynecology unit of Hospital Quiro´n Salud, Madrid (2007-2018) with irregular menstruation, amenorrhea or menopausal symptoms. Inclusion criteria were one or more blood samples with determinations of fasting glucose and lipids (total cholesterol, low-density lipoprotein cholesterol [LDL-c], high-density lipoprotein cholesterol [HDL-c] and triglycerides [TGs]) from women with a menopause diagnosis recorded in the hospital database. The determinations were classified as perimenopausal or postmenopausal based on the date of last menstruation.

Results: In total, 13,517 laboratory studies (3,073 perimenopausal and 10,444 postmenopausal) from 275 women were analyzed. Total cholesterol, LDL-c, and TG levels were significantly higher in postmenopausal women than in perimenopausal women, whereas HDL-c levels were significantly lower ($P<0.05$ in all cases). Further adjustment by age showed differences only in LDL-c levels. Menopausal status, TG levels, and the number of pregnancies were independently related with total cholesterol and LDL-c levels. HDL-c levels were independently affected by menopausal age, TG levels, and number of pregnancies. Finally, TG concentration was independently affected by total cholesterol, LDL-c, and HDL-c levels.

Conclusion: Our study suggests that significant changes in LDL-c levels occur during the menopausal transition. Total cholesterol and LDL-c changes are independently affected by menopausal status and HDL-c is influenced by menopausal age.

Gambaran Profil Lipid Pada Wanita Menopause (Studi Pustaka)

Diyah Kesuma Dewi[1], Sri Ujiani , S.Pd., M.Biomed[2], Dr.Zulfian, Sp.PK[3]
Program Studi Teknologi Laboratorium Medis Program Diploma Tiga Jurusan Analis Kesehatan Politeknik Kesehatan Tanjungkarang

ABSTRAK

Menopause merupakan suatu keadaan dimana berhentinya siklus menstruasi atau haid, diawali dengan tidak teraturnya periode menstruasi. Biasanya wanita yang sedang dalam tahap atau telah memasuki masa menopause akan mengalami berbagai perubahan, salah satunya adalah perubahan hormonal, khususnya penurunan hormon estrogen yang dihasilkan oleh folikel ovarium. Penurunan hormon estrogen berdampak pada munculnya berbagai keluhan, salah satunya yaitu perubahan metabolisme lipid. Tujuan penelitian ini adalah untuk melihat kadar profil lipid pada wanita menopause. Jenis penelitian ini adalah studi pustaka menggunakan 10 artikel jurnal ilmiah yang terpublikasi secara nasional dan internasional. Hasil studi pustaka yang menunjukan 5 dari 10 artikel menunjukan penurunan kadar HDL dan 8 dari 10 artikel menyatakan kadar normal pada HDL. Selanjutnya pada kadar LDL didapatkan 9 dari 10 artikel yang menyatakan peningkatan kadar LDL dan 4 dari 10 artikel menyatakan kadar normal pada LDL. Kemudian pada kadar Trigliserida didapatkan 2 dari 10 artikel yang menyatakan peningkatan kadar Trigliserida dan 10 jurnal menyatakan kadar normal pada Trigliserida. Pada kadar kolesterol total didapatkan 4 dari 10 artikel yang menyatakan peningkatan kadar kolesterol total, kemudian 8 dari 10 artikel menyatakan kadar normal pada kolesterol total.

Kata Kunci : Menopause dan Profil Lipid
Daftar Bacaan : 43 (1994 -2020)

Description Of Lipid Profile In Menopausee Women (Litterature Riview)

ABSTRACT

Menopause is a condition where the menstrual cycle or menstruation stops, beginning with irregular menstrual periods. Usually women who are in the stage or have entered menopause will experience various changes, one of which is hormonal changes, especially a decrease in the hormone estrogen produced by the ovarian follicles. The decrease in the hormone estrogen has an impact on the emergence of various complaints, one of which is changes in lipid metabolism. The purpose of this study was to examine the levels of lipid profiles in postmenopausal women. This type of research is a literature study using 10 scientific journal articles published nationally and internationally. The results of a literature study showed that 5 out of 10 articles showed a decrease in HDL levels and 8 out of 10 articles stated normal levels of

HDL. Furthermore, on LDL levels, 9 out of 10 articles stated an increase in LDL levels and 4 out of 10 articles stated normal levels in LDL. Then on triglyceride levels, 2 out of 10 articles stated increased levels of triglycerides and 10 journals stated normal levels of triglycerides. In total cholesterol levels, 4 out of 10 articles stated an increase in total cholesterol levels, then 8 out of 10 articles stated normal levels in total cholesterol.

Keywords : Menopause and Lipid Profile

Korespondensi: Diyah Kesuma Dewi, Program Studi Teknologi Laboratorium Medis Program Diploma Tiga Jurusan Analis Kesehatan, Politeknik Kesehatan Tanjungkarang, Jalan Soekarno-Hatta No.1 Hajimena Bandar Lampung, mobile 083168819315, email diyahkesuma12@gmail.com

Pendahuluan

Perubahan sistem reproduksi akibat penuaan biasanya dimulai selama dekade kelima dalam kehidupan. Kebanyakan perempuan mengalami menopause di awal usia 50-an. Pandangan medis menopause diartikan sebagai masa penghentian menstruasi untuk selamanya. Masa menopause ini tidak bisa serta-merta diketahui, tetapi biasanya akan diketahui setelah setahun berlalu. Menopause merupakan suatu proses peralihan dari masa produktif menuju perlahan-lahan masa non produktif yang disebabkan berkurangnya hormon progesteron dan estrogen (Suparni & Astutik, 2016).

Menurut data dari World Health Organization (WHO), menopause pada Tahun 2030 diperkirakan akan mencapai 1,2 miliar wanita yang berusia di atas 50 Tahun hal ini menunjukkan angka peningkatan jumlah menopause. Sebagian besar (sekitar 80 persen) tinggal di negara berkembang. Setiap tahunnya populasi wanita menopause di dunia meningkat sekitar 3%. Berdasarkan perkiraan menunjukkan akan terdapat sekitar 30-40 juta wanita usia lanjut (wulan) dari seluruh jumlah penduduk Indonesia yang berjumlah 240-250 juta. Dalam kategori wulan tersebut (usia lebih dari 60 tahun), hampir 100% telah mengalami menopause dengan segala akibat serta dampak yang menyertainya

Berbagai keluhan yang mungkin terjadi di masa menopause disebabkan oleh kekurangan hormon estrogen, dan hormon progesteron, yang diproduksi oleh ovarium, serta peningkatn LH (luteinizing hormone) dan FSH (follicle-stimulating hormone) yang di produksi oleh kelenjar hipofisis anterior. Namun, yang paling berpengaruh secara klinis terhadap tubuh adalah hilangnya hormon estrogen. Dengan estrogen, LDL menurun, dan sebaliknya HDL meningkat yang dapat mencegah terjadinya sklerosis di pembuluh darah. Di usia yang semakin tua, kadar kolesterol HDL relatif tidak berubah sedangkan kadar kolesterol total

cenderung lebih tinggi kadarnya (Hutabarat, 2009).

Estrogen diketahui juga berfungsi sebagai antioksidan. Kolesterol LDL lebih mudah menembus plak di dalam dinding nadi pembuluh darah apabila dalam kondisi teroksidasi. Peranan estrogen sebagai antioksidan adalah untuk mencegah proses oksidasi LDL, sehingga kemampuan LDL untuk menembus plak akan berkurang. Pada saat menopause, kadar estrogen dalam darah mulai berkurang dan dapat menimbulkan efek berkeringat pada waktu tidur, dan kecemasan yang berlebihan, termasuk meningkatnya resiko mengidap berbagai penyakit.

(Nugroho 2016)

Madhavi (2014) telah melakukan penelitian mengenai

profil lipid wanita menopause di kota Hubli. Berdasarkan hasil penelitian yang dilakukan didapatkan hasil rerata kadar kolesterol total adalah 183 ±47.92 mg/dl, rerata trigliserida adalah 149.80±72.1 mg/dl, rerata LDL adalah 108.76±46.4 mg/dl, dan rerata HDL adalah 44.74 ±14.14 mg/dl. Pada penelitian ini dapat disimpulkan bahwa kadar kolestrol total, trigliserida, dan HDL menunjukan normal, untuk kadar LDL meningkat pada keadaan menopause.

Metodologi Penelitian

Jenis dan rancangan yang digunakan pada penelitian yang berjudul gambaran profil lipid pada watinta menopause adalah studi kepustakaan (Library Research) yang didapat dengan menelaah artikel, jurnal ilmiah, dan buku yang berkaitan dengan profil lipid pada wanita menopause yang dipublikasikan secara nasional maupun internasional dalam waktu 10 tahun terakhir. Terdapat dua kriteria dalam penelitian ini yaitu kriteria inklusi yang mendukung penelitian yaitu jurnal yang memenuhi syarat yang menjawab semua tujuan penelitian ini, sedangkan kriteria eksklusi adalah yang tidak mendukung penelitian ini yaitu jurnal yang hanya menjawab salah satu tujuan atau tidak menjawab semua tujuan penelitian ini. Waktu yang digunakan peneliti untuk melakukan penelitian kepustakaan ini dilaksanakan pada bulan Maret sampai Juli 2021

Hasil dan Pembahasan

Hasil penelitian studi pustaka ini didapatkan dari kajian sepuluh artikel ilmiah yang dipublikasikan pada satu jurnal nasional dan sembilan jurnal internasional. Rentang tahun publikasi adalah tahun 2010 sampai 2020, Pencarian literatur menggunakan database yaitu *Google*

Schoolar dan *Researchgate*. . Berdasarkan hasil review dari 10 literatur didapatkan hasil sebagai berikut.

Tabel 4.2 Hasil Meta Analisa Pada 10 Artikel Jurnal.

No	Nama Penulis	Sampel	Pra-Menopouse				Pasca-Menopouse			
			HDL	LDL	TG	TC	HDL	LDL	TG	TC
1.	Swapnali *et al.,*	123 responden pra menopause dan pascamenopause	39,7	95,8	86,6	152	30,9	153,8	112,8	207,2
2.	Madhavi *et al.,*	50 wanita pascamenopause	-	-	-	-	44,7	108,7	149,8	183
3.	Sidahmed *et al.,*	40 wanita premenopause & 60 wanita pascamenopause	84,8	31,7	103,4	137,2	62,6	75,1	104,6	159,5
4.	Radhika *et al.,*	124 wanita menopause	52,15	124	125,8	201,6	55,8	146,4	156,8	234,7
5.	Sivapriya *et al.,*	60 wanita pascamenopause	-	-	-	-	32.77	129.9	127.7	184.05
6.	Fatma *et al.,*	210 wanita premenopause & 200 pascamenopause	43,01	77,11	100,8	138,5	34,4	108,5	145,9	166,8
7.	B udhakar *et al.,*	100 wanita menopause	42,14	103,5	117,7	171,9	37,1	118,3	160,3	187,5
8.	Alneil *et al.,*	94 wanita menopause	52,01	159,1	87,40	175,9	40,72	171,2	142,7	245,1

9.	Athraa *et al.*,	40 wanita pramenopause & 60 wanita pascamenopause	43.13	77,23	101,9	138,8	33,5	107,5	144,3	167,7
10.	Veronica *et al.*,	Wanita menopause yg didiagnosis dokter	65,1	125,0	83,4	207,3	67,8	136,5	77,9	220,5

No	Profil Lipid	Hasil	Referensi
1.	HDL	Meningkat	-
		Menurun	6. Swapnali *et al.*, 7. Sivapriya *et al.*, 8. Fatma *et al.*, 9. B Sudhakar *et al.*, 10. Athraa *et al.*,
		Normal	9. Madhavi *et al.*, 10. Sidahmed *et al.*, 11. Radhika *et al.*, 12. Fatma *et al.*, 13. B Sudhakar *et al.*, *14.* Alneil *et al.*, 15. Athraa *et al.*, 16. Veronica *et al.*,
2.	LDL	Meningkat	10. Swapnali *et al.*, 11. Madhavi *et al.*, 12. Radhika *et al.*, 13. Sivapriya *et al.*, 14. Fatma *et al.*, 15. B Sudhakar *et al.*, *16.* Alneil *et al.*, 17. Athraa *et al.*, 18. Veronica *et al.*,

		Menurun	-
		Normal	5. Swapnali *et al.*, 6. Sidahmed *et al.*, 7. Fatma *et al.*, 8. Athraa *et al.*,
3.	TRIGLISERIDA	Meningkat	3. Radhika *et al.*, 4. B Sudhakar *et al.*,
		Menurun	-
		Normal	11. Swapnali *et al.*, 12. Madhavi *et al.*, 13. Sidahmed *et al.*, 14. Radhika *et al.*, 15. Sivapriya *et al.*, 16. Fatma *et al.*, 17. B Sudhakar *et al.*, *18.* Alneil *et al.*, 19. Athraa *et al.*, 20. Veronica *et al.*,
4.	TOTAL CHOLESTEROL	Meningkat	5. Swapnali *et al.*, 6. Radhika *et al.*, *7.* Alneil *et al.*, 8. Veronica *et al.*,
		Menurun	-
		Normal	9. Swapnali *et al.*, 10. Madhavi *et al.*, 11. Sidahmed *et al.*, 12. Sivapriya *et al.*, 13. Fatma *et al.*, 14. B Sudhakar *et al.*, *15.* Alneil *et al.*, 16. Athraa *et al.*,

Berdasarkan hasil dari 10 artikel yang telah dikaji, didapatkan fokus pada studi pustaka yang menunjukan 5 dari 10 artikel menunjukan penurunan kadar HDL dan 8 dari 10 artikel menyatakan kadar normal pada HDL. Selanjutnya pada kadar LDL didapatkan 9 dari 10 artikel yang menyatakan peningkatan kadar LDL dan 4 dari 10 artikel menyatakan kadar normal pada LDL. Kemudian pada kadar Trigliserida didapatkan 2 dari 10

artikel yang menyatakan peningkatan kadar Trigliserida dan 10 jurnal menyatakan kadar normal pada Trigliserida. Pada kadar kolesterol total didapatkan 4 dari 10 artikel yang menyatakan peningkatan kadar kolesterol total, kemudian 8 dari 10 artikel menyatakan kadar normal pada kolesterol total .

Peningkatan kadar kolestrol total, LDL dan trigliserida disebabkan oleh penurunan sekresi estrogen dengan penghentian fungsi ovarium berkontribusi pada peningkatan kadar kolesterol LDL pada wanita menopause karena estrogen meningkatkan sintesis reseptor LDL kolesterol hati untuk Apo-β100 yang mengakibatkan peningkatan serapan kolesterol LDL dan oleh karena itu menurunkan tingkat LDL yang bersirkulasi. Dengan demikian,kekurangannya menyebabkan peningkatan kolesterol LDL pada wanita menopause (arca dkk., 1994).

Hal ini sejalan dengan penelitian yang dilakukan oleh penelitian Swapnali *et al* yang menunjukan bahwa pada wanita menopause di India, nilai rerata kolesterol total, trigliserida, dan kolesterol LDL meningkat kecuali kolesterol HDL yang menurun. Keadaan tersebut diakibatkan oleh defisiensi estrogen pada pascamenopause.

Efek perubahan hormonal yang terkait dengan menopause pada kadar lipid serum memainkan peran penting dalam sebagian besar gangguan terkait jantung yang terkait dengan menopause (Do dkk., 2000). Sampai dengan usia 50 tahun,prevalensi penyakit arteri koroner (PJK) pada wanita lebih rendah dibandingkan pada pria, tetapi insidensinya meningkat secara signifikan setelah menopause. Insiden penyakit jantung koroner telah diamati meningkat pada wanita pascamenopause sampai mereka menjadi serupa dengan tingkat yang sesuai pada pria dengan usia yang sama (Berg, 2004).

Menurut teori Graha (2010), peningkatan kadar kolesterol juga dapat dipengaruhi oleh usia yang semakin bertambah. Hal ini dipengaruhi oleh kemampuan tubuh dalam metabolisme lemak. Pada seseorang yang berusia lanjut kadar kolesterol dalam darah cenderung tinggi yang dapat meningkatkan resiko dari berbagai penyakit. Bagi wanita biasanya kadar kolesterol ini akan meningkat ketika masa menopause karena dimasa inilah kadar LDL dalam tubuhnya semakin meningkat sehingga memperbesar risiko terjadinya penumpukan kolesterol di saluran darahnya.

Keimpulan

Berdasarkan hasil studi pustaka yang dilakukan pada 10 artikel mengenai gambaran profil lipid pada wanita menopouse dapat disimpulkan sebagai berikut:

5. Pada 5 dari 10 arikel menunjukan penurunan kadar

HDL dan 8 dari 10 artikel menyatakan kadar normal pada HDL.

6. Pada 9 dari 10 artikel menyatakan peningkatan kadar LDL, Kemudian 4 dari 10 artikel menyatakan kadar normal pada LDL.
7. Pada 2 dari 10 artikel menyatakan peningkatan kadar trigliserida, Dan 10 artikel menyatakan kadar normal pada trigliserida.
8. Pada 4 dari 10 artikel menyatakan peningkatan kadar kolesterol total, Kemudian 8 dari 10 artikel menunjukan kadar normal pada kolestrol total.

C. Saran

4. Perlu melakukan pemeriksaan profil lipid secara rutin, mengontrol asupan makanan, aktifitas fisik dan berat badan pada wanita yang sudah mengalami menopause.
5. Perlu adanya penanganan secara khusus apabila kolesterol total, kolesterol LDL, kolesterol HDL, dan trigliserida tidak berada pada nilai optimal (tidak sesuai nilai rujukan).
6. Bagi peneliti selanjutnya disarankan melakukan penelitian profil lipid pada wanita menopause berdasarkan lamanya menopause untuk melihat adanya hubungan antara lamanya menopause dengan hasil profil lipid

DAFTAR PUSTAKA

Alneil Hamzah, Moadah Abbas, Elyasa Elfaki,Mariam Ibrahim, Ezeldine K Abdalhabi dan Tarig Karar (2019) *Assessment of Plasma Lipid Profile Among Sudanese Menopausal Women in Khartoum State-Sudan*

Athraa Fouad Kadhuim. 2020 . *Estimation of Serum Lipid Profile among Pre and Post-Menopausal Women in Baghdad City*. Middle Technical University

Berg G, Mesch V dkk. *Profil Lipid dan Lipoprotein dalam Transisi Menopause. Pengaruh Hormon, Usia dan Distribusi Lemak*. Penelitian Hormon dan Metabolik 2004; 36: 215-220.

B Sudhakar Babu, G Aparna, C Niranjan Paul (2019) *Comparative assessment of*

serum lipid profile levels between premenopausal and postmenopausal healthy woman- A case control study

Fatma Mustafa Mohammad, Nihad AbdulJabbar Jalal and Chateen I Ali Pambuk. 2017 . *A Comparative Study to Evaluate the Serum Lipid Profile in Pre and Postmenopausal Woman in Sulaymaniyah City _ Iraq*. Al-Qalam University College, Kirkuk, Iraq

Graha, C. (2010*). Question & Answers Kolesterol.* Jakarta: PT. Media Elex Komputindo.

Hutabarat, 2009, *Hormon dan Sisrem Endokrin,* http//www.medicastore.com. Post: 8 Maret 2010.

Madhavi D. Kulkarni, K.F. Kammar. 2014 . *Lipid Profile in Postmenopausal women of Hubli city.*

Nugroho, R. A. 2016. *Dasar-Dasar Endokrinologi. Mulawarman* .University Press. Samarinda

Radhika Shenoy, Pradeep Vernekar. 2015. *Fasting Lipid Profile in Pre- and Post-Menopausal Women: A Prospective Study*

RK Swapnali, Ravikiran Kisan, DS Jayaprakash Muthy .2011 . *Pengaruh Menopause pada Profil Lipid dan Apolipoprotein*

Sidahmed Yassin, Gad Allah Modawe, AbdElkarim A. Abdrabo (2015) *Assessment of Lipid Profile among Healthy Sudanese Post Menopausal Ladies*

Sivapriya. A and Santhanalakshmi. L.2017. *Effect Of Duration Of Menopause On Serum Lipid Profile In Postmenopausal Women.*

Srinivas Reddy Kilim, Srinivasa Rao Chandala. 2013. *A Comparative Study of Lipid Profile and Oestradiol in Pre- and Post-Menopausal Women*

Veronica Inaraja, Israel Thuissard, ett all. 2020. *Profil Lipid Berubah Selama Transisi Menopause*