Study of Serum lipid profile in Prepubertal, Reproductive and Postmenopausal women.

[1]A.R.Vidyullatha, [2] M.Veera Mohan Rao, [3]Akshay Berad

[1]Assistant Professor, Dept. of Physiology, Chalmeda Anandrao Institute of Medical Sciences, Karimnagar, Telangana.

India.

[2]Associate Professor, Dept of Physiology, Kurnool Medical College. Kurnool. AP.

[3]Assistant Professor, Dept. of Physiology, Chalmeda Anandrao Institute of Medical   Sciences, Karimnagar, Telangana.

India.

Correspondence Author: M. Veera Mohan Rao, Associate Professor, Dept of Physiology, Kurnool Medical College.

Kurnool.Andra Pradesh.

Conflicts of Interest: Nil

Abstract

According to WHO estimates, 16.7 million people around the globe die of cardiovascular disease each year. Economic transition, urbanization, industrialization and globalization bring about life style changes that promote heart disease. High blood pressure, high cholesterol and obesity are likely to become more prevalent in developing countries. Increased energy intake and sedentary lifestyle are also responsible for heart disease. The presence of one or more cardiovascular risk factors like high levels of TC, LDL, TG, glucose, insulin, BMI and a decreased HDL have been found to increase the progression of prehypertension to hypertension. Prehypertension increases the risk of MI and CAD. The present study was undertaken to know serum lipid profile changes in prepubertal, reproductive and postmenopausal women. Life style patterns like diet ,physical activity were included in study. Total 90 Subjects of age group 8-10Years (prepubertal), 20-45years (reproductive), 46-55years (postmenopausal) female volunteered for our study. During the study period, BMI, Lipid profile , dietaty intake and physical activity and parameters were recorded in all the subjects. In all the three groups from prepubertal to post menopausal women BMI, TC, LDL,VLDL, TG, is gradually increased. HDL is gradually decreased from pre pubertal to post menopausal women. We concluded the presence of normal lipid profiles and Cardio protective HDL is normally higher in prepubertal females. Lower levels of HDL increases CVD risk. This can be attributed mainly to sedentary life style, stress and dietary habits this is seen in post menopausal women.

Keyword: BMI, HDL,TG,TC, CAD.

Introduction

According to WHO estimates , 16.7 million people around the globe die of cardiovascular disease each year[1]. As the total CVD deaths annually, about 8.6 million are of women[2] Heart attack and stroke deaths are responsible for twice as many deaths in women as all cancers combined. Economic transition, urbanization, industrialization and globalization bring about life style changes that promote heart disease. High blood pressure, **high cholesterol** and obesity are likely to become more prevalent in developing countries. High blood cholesterol is estimated to cause about 4.4million deaths this amounts to 18% of strokes and 56% of global CHD [3]. The WHO predicts that unless action is taken by 2020 there will be 5 million deaths attributable to overweight and obesity ,compared to 3 million now[4]. Increased **energy intake**

and sedentary lifestyle are also responsible for heart disease. 60-85%of the world population from both developed and developing countries are not physically active enough to gain health benefits. Every year more than 2million deaths are attributable to physical inactivity worldwide[5]. With the increase in life expectation to 64 years in females in india ,number of women living in India is increasing .so the risk of CAD is more in postmenopausal women [6]. The presence of one or more cardiovascular risk factors like high levels of TC, LDL, TG, glucose, insulin, BMI and a decreased HDL have been found to increase the progression of prehypertension to hypertension. Prehypertension increases the risk of MI and CAD[7]. Postmenopausal age, unhealthy life style-high energy intake, physical inactivity, raised BMI, all these factors increase the prevalence of CAD in women. In present study three different age groups of women : Prepubertal, Reproductive and Postmenopausal women. To evaluate the cardiac risk factors among these women: lipid profile, BMI, diet, physical activity. The subjects were healthy attenders accompanying of Kurnool medical college Kurnool.

Material and Methods

The present study was undertaken to know serum lipid profile changes in prepubertal, reproductive and postmenopausal women. Life style patterns like diet, physical activity also alters the lipid profile so these parameters were included in my study. Healthy subjects of Kurnool medical college with no evidence of metabolic or endocrinal abnormalities, hypertension or coronary heart disease were selected randomly for pre pubertal reproductive and post menopausal age group consisting of 30 subjects in each group.Total 90 Subjects of age group 8-10Years (prepubertal), 20-45years (reproductive), 46-55years (postmenopausal) female volunteered for our study. During the study period, anthropometric,

biochemical , dietaty intake and physical activity and parameters were recorded in all the subjects.

Measurement of biochemical parameters:

Venous blood samples (5 ml) were collected from 90subjects after an overnight fast for determination serum lipid profile. The serum was separated within 2 hours of blood collection using a centrifuge at 1000 rpm for about 20 minutes at room temperature.

Estimation of Total cholesterol(TC) ,Triglycerides(TG) and (High densitylipoprotein)HDL was carried out using enzymatic method. Low density lipoprotein (LDL),VLDL were also estimated. BMI was calculated (measured as weight in kilograms divided by square of height in meters).Individual diet history was taken and Calorie intake was calculated depending upon calorific value of some routinely taken cooked preparation. Daily Physical activity history was taken and level of activity was noted. Daily physical activity (minutes/ day).Lipid profile , BMI ,Calorie intake , physical activity was compared in Three groups. The data collected in this study was analyzed statistically by computing the descriptive statistics viz .mean ,standard deviation, comparision is analyzed by using ANOVA. The 'P' value ≤ 0.05 was considered as statistically significant.

Results

Table 1 shows the mean, standard deviation, for age difference in three age groups.

AGE	Pre pubertal age group 8-10years	Reproductive age group(20-45 years)	Post menopausal age group 46-55
Mean	8.433333333	33.1	49.33333333
SD	0.6789105539	6.900024987	2.279342515

Table 2 shows the mean, standard deviation, BMI age groups.

BMI	Pre pubertal age group 8-10years	Reproductive age group(20-45 years)	Post menopausal age group 46-55
Mean	15.78633333	23.11833333	25.74833333
SD	1.521597353	2.646287032	2.881575339

Table 3 shows the mean, standard deviation, value for physical activity.

PHYSICAL activity Min/day	Pre pubertal age group 8-10years	Reproductive age group(20-45 years)	Post menopausal age group 46-55
Mean	46.83333333	82	42.35294118
SD	11.40805322	43.8178046	14.26508489

Table 4 shows values of Lipid profile parameters, physical activity,calorie intake and BMI in Pre-Pubertal and Reproductive age group

PARAMETERS	PRE-PUBERTAL		REPRODUCTIVE		P value
	Mean	SD	Mean	SD	
BMI	15.78633333	1.521597353	23.11833333	2.646287032	< 0.00001
TC	167.0333333	30.70940924	170.3	36.34238525	0.708253
HDL	64.83333333	31.63595001	55.33333333	41.27396552	0.321187
LDL	84.5	46.46003102	102.6333333	27.48477112	0.070899
VLDL	22.5	6.185355341	25.5	6.94187692	0.082443
TG	112.8666667	30.82512783	129	33.98275425	0.059010
DIET	1824.433333	195.5610291	2722.833333	335.2628494	< 0.00001
PHYSICAL ACTIVITY	46.83333333	11.40805322	82	43.8178046	< 0.00001

Table 5 shows values of Lipid profile parameters, physical activity, calorie intake and BMI in Reproductive and Post menopausal group.

PARAMETERS	POST MENOPAUSAL WOMEN		REPRODUCTIVE		P value
	Mean	SD	Mean	SD	
BMI	25.74833333	2.881575339	23.11833333	2.646287032	0.0005095
TC	206.5333333	59.84677754	170.3	36.34238525	0.0063077
HDL	43.13333333	6.49526795	55.33333333	41.27396552	0.1151860
LDL	124.4333333	70.24866342	102.6333333	27.48477112	0.1188853
VLDL	35.6	10.65962411	25.5	6.94187692	< 0.00001
TG	162.7666667	68.01200874	129	33.98275425	0.0180973
DIET	2728.5	336.9721927	2722.833333	335.2628494	0.9481635
PHYSICAL ACTIVITY	24	23.83130367	82	43.8178046	< 0.00001

In all the three groups from prepubertal to post menopausal women BMI, TC, LDL,VLDL, TG, is gradually increased. HDL is gradually decreased from pre pubertal to post menopausal women. The physical activity is more in the reproductive age is more when compare to prepubertal and post menopausl women .The post menopausal women were less physically activite when compare to other groups.The difference in the physical activity in three age groups statistically significant. There was a gradual increase in the lipids TC, LDL ,VLDL ,TG from prepubertal to reproductive to postmenopausal women and there was a gradual decrease in the HDL from prepubertal to postmenopausal women as the age difference increases.

Discussion

In the present study there was a significant difference in BMI, TC, LDL, HDL, VLDL ,TG, Diet, physical activity with significant p value of <0.05 Estrogen has a beneficial effect on lipid metabolism .Estrogen reduces the degradation of HDL by inhibiting the enzymatic action of lipoprotein lipase. So in the presence of estrogen there will be more amount of HDL in the prepubertal and reproductive women. Ovaries are the only source for estrogen in the women and these ovaries become inactivated and the source of estrogen is reduced in the postmenopausal women. So the postmenopausal women

have more degradation of HDL when compare to prepubertal and reproductive women so the HDL levels are decreased in the post menopausal women. We found that prepubertal women had a heigher HDL levels and lower TC, LDL, VLDL, TG compared to reproductive and post menopausal women. Post menopausal women had higher had higher TC, and lower HDL levels. Reproductive women had more physical activity and postmenopausal women had less physical activity. **Goswami K and Bandyopadhyay A** showed that HDL cholesterol was significantly decreased in post menopausal women and significant rise in TC and LDL – cholesterol[8]. **Gandhi BM** showed Triglycerides in plasma increased with age [9]. **Bonithon-kopp** concluded that total cholesterol and LDL cholesterol significantly increased in postmenopausal women[10]. **Nerbrand et al, smiti nanda et al** suggested that loss of endogenous sex steroids contribute substantially to increased atherogenic lipid profile[11]. **Bhagya et al** concluded that total cholesterol increases significantly with age and the significant rise in LDL is mainly due to hormonal levels in post menopausal women[12].

Our study group being otherwise normal subjects .Assessing the presence of major CVD risk factors in women of particular importance, since it would allow us to promptly identify persons at high risk for development of clinical CVD later in life. We concluded the presence of normal lipid profiles and Cardio protective HDL is normally higher in prepubertal females. Lower levels of HDL increases CVD risk. This can be attributed mainly to sedentary life style, stress and dietary habits this is seen in post menopausal women .

Conclusion

Present study aims to study lipid profile, BMI, Diet, physical activity parameters in prepubertal , reproductive and post menopausal women. We concluded the presence

of normal lipid profiles and Cardio protective HDL is normally higher in prepubertal females.Post menopausal females had higher Total cholesterol ,Triglycerides ,and low High density lipoprotein. Specific evaluation, treatment and prevention strategies must be implemented to reduce the CVD burden and promote health in post menopausal women .

References

[1]. WHO world health report, 2003.

[2].WHOnewsrelease.www.who.int/mediacentre/releases/2003/pr72/en/.

[3]. Chockalingam A,Balaguer-vintro 1. *Impending global pandemic of cardiovascular diseases*.Barcelona,Spain:Prous Science;1999.

[4]. WHO Report 2002-Preventing Risks, Promoting HealthyLife .

[5]. World Heart Federation Fact Sheet, 2002.

[6]. Park's Textbook of Preventive and Social medicine – K Park 18th edition M/s. Banarasidas Bhanot Publishers, 2005.

[7]. Madanmohan, Nandeesha H, Bobby Z, Sathyapriya V, Shenoy P, Sunil S. Dyslipidaemia antedates occurrence of clinical hypertension in non-diabetic, nonobesemale subjects. Indian J Physiol Pharmacol 2007; 51:96-8.

[8]. Goswami K, Bandyopadhyay A. Lipid profile in middle class Bengali population of Kolkota. Indian J Clin Biochem. 2003; 18 (2): 127-30.

[9]. Gandhi BM. Lipoprotein Composition of normal healthy subjects in northern India. Ind T Med Res. 1982; 75: 393-401.

[10]. Bonithon-Kopp C, Scarabin PY, Darne B, Malniejac A, Guize L. Menopause related changes in lipoproteins and some other cardiovascular risk factors. Int J Epidemiol. 1990; 19 (1): 42-48.

[11]. Nebrand C, Lidfeldt J, Nyberg P, Schersten B, Samsioe G. Serum lipids and lipoproteins in relation to

endogenous and exogenous female steroids and age. The Women's Health in Leend Area (WHILA) study. Maurietas. 2004 ;15; 48 (2): 161-169.

[12]. Bhagya .v /Int J Biol Med Res.2011;2(3):639-642 .study of serum lipid profile.