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SERUM TOTAL CHOLESTEROL AND BODY MASS INDEX IN DYSMENORRHEA

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ABSTRACT

The total cholesterol and body mass index of 50 dysmenorrheic females and a control group of 50 non-dysmenorrheic females, aged between 18-35 years were estimated. The mean serum total cholesterol of dysmenorrheic females was 5.10± 0.80mmol/L and 3.70±0.40mmol/L for the non-dysmenorrheic females. The mean body mass index of the dysmenorrheic females was 23.80±4.80 and 22.50±1.90 for the control group. The mean serum total cholesterol concentration of the dysmenorrheic females was significantly higher ($P<0.05$) than that of the non-dysmenorrheic cohort. There was however no significant difference ($P>0.05$) in the body mass index of these two groups. The results of this study suggest that elevated cholesterol level may be a predisposing factor to dysmenorrhea in menstruating females.

KEY WORDS: Body mass index, cholesterol, Dysmenorrhea

INTRODUCTION

Dysmenorrhea is probably the most common of all gynaecological disorders (Bruce and Ackerman, 1993) and is usually associated with dysrythmic uterine contractions and hence pain during menstruation (West 1990). Some degree of discomfort is experienced by over half of all post menarcheal women (after the onset of menstruation) and 10% of these are incapacitated for one to three days each month (Llewellyn Jones, 1996). This disorder has considerable economic impact and also is the greatest cause of lost - time from work and school in women (Taylor et al, 1998). About 50% of all post-menarcheal women complain of dysmenorrheic pains at some stage of their lives (Llewellyn Jones, 1996).

Many theories have been advanced to explain the etiology of this disorder and a number of factors may be involved, for example, it was postulated that specific substances liberated from the endometrium (e.g. prostaglandins) during menstruation might be the etiological agent (Ganong,1997). Recent works has led to a better understanding of the pathophysiology of the disorder (Ratnam et al, 1997). Hartz et al, (1987) stipulated that menstrual disorders in women have been found to be related to body mass index ratio as well as fat distribution. High body mass index ratio, as well as a predominance of fat distribution in the abdominal regions have been found to be sometimes associated with menstrual disorders (Clavo, 1991). Obese women may have irregular cycle and dysmenorrhea than women of normal weight and weight loss often restores normal regular cycle (Andersch , 1987). Body mass index and serum cholesterol level as a non- invasive predictor of body fat and caloric balance has therefore been implicated in menstrual disorders to which dysmenorrhea rate highest (Nduka and Agbedana, 1997)

This work assesses the serum total cholesterol level and body mass index in young females with dysmenorrhea and non dysmenorheic subjects to ascertain if there is a correlation or relationship between these two parameter and dysmenorrhea in our society.

MATERIALS AND METHOD

Subjects were young females aged between 18-35 years from university of Calabar and its environs. Samples were collected on the 1st and /or 2nd day of their menstrual bleeding (dysmenorrheic pains are most severe between day 1 & 2) from both dysmenorrhic subjects and non-dysmenorrhic subjects (controls).

Five milliliters of fasting whole blood samples were collected aseptically via venepuncture using 21SWG needle and syringe into clean plain containers .Serum was separated from the clotted sample and dispensed into serum containers. Total cholesterol determination was carried out by the enzymatic method.

The height and weight of the subjects were determined using standometer and bathroom scale while other information as age, diet, drugs, severity and duration of pains are determined using a comprehensive questionnaire.

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Table 1

SERUM TOTAL CHOLESTEROL AND BODY MASS INDEX OF DYSMENORRHEIC AND NON DYSMENORHEIC SUBJECTS.

Subjects	Mean Serum Total Cholesterol (mmol/L)	Mean Body Mass Index (kg/m)
Dysmenorrheic subjects	5.10± 0.80	23.80 ± 4.80
Normal subjects	3.70 ± 0.40	22.50 ± 1.90
n	50	50
Significance level	P <0.05	P > 0.05

Table 1: Shows serum total cholesterol and body mass index of dysmenorrheic and non dysmenorrheic females, the mean serum total cholesterol level was 5.10±0.80 mmo/L for dysmenorrheic females and 3.7±0.40mmol/L for non dysmenorrheic females. The lowest serum cholesterol level obtained for dysmenorrheic females was 4.08mmo0l/L while the highest was 6.80mmol/L. The lowest serum cholesterol level for non-dysmenorrheic subjects was 2.69mmol/L while the highest was 4.58mmol/L. The serum cholesterol level in dysmenorrheic females was found to be significantly higher (P<0.05) when compared to those of the non-dysmenorrheic subjects.

The mean body mass index were 23.80 ± 4.80kg/m and 22.50 ±1.90kg/m for dysmenorrheic and non dysmenorrheic females respectively. The lowest and highest value for non dysmenorrheic subjects were 18.38kg/m and 25.78kg/m while the lowest and highest values for dysemenorrheic females were 20.31kg/m and 28.02kg/m. There was no significant difference (P>0.05) in body mass index of dysmenorrheic and non dysmenorrheic females.

DISCUSSION

Pelvic pain resulting from dysmenorrhea is common among young women in our society and can result from a number of physiological and pathological etiologies both gynaecological and non-gynaeeological in origin (Banerjee and Laufer, 1998). A proper classification of this and its origin is most essential for the most appropriate therapy to be chosen (Fasce and Gorlero, 1998). Total cholesterol and body mass index have been implicated in several clinical conditions such as coronary Heart disease, obesity , endometriosis artherosclerosis, uterine fibromyomas including dysmenorrhea (Taylor et al, 1998, Garcia- Leon et al 2000, Stensland –bugge et al 2000).

Body mass index as a good index of total body fat was first proposed by Quetelet in 1871 (Stein and Myers, 1996). Menstrual disorders were found to be related to a high body mass index as well as to a fat concentration in the abdominal region (Hartz et al, 1987). Women with high body mass index or inclined to obesity have been known to have menstrual disorders than those of normal weight and body mass index, (Hartz et al, 1987). However, in this study there was no significant difference (P>0.05) in the body mass index of dysmenorrheic and non-dysmenorrheic females. The present findings show that females within the normal BMI range and normal weight were found to be dysmenorrheic also (Venturini et al, 1998). This was not in accordance with the findings of Young , (1996) who stipulated that women over 80kg might be subject to menstrual disorders as dysmenorrhea. The height of dysmenorrheic females were observed not have any significant difference when compared to those of the non dysmenorrheic control females. This have previously been reported in Caucasians (Tietz et al, 2000, Owen et al 1998). Young , (1996) reported a positive correlation of serum cholesterol and BMI, in this study however a negative correlation of serum cholesterol and body mass index was observed between dysmenorrheic females and non-dysmenorrhac controls since females of normal weight also have menstrual disorders. The mean serum total cholesterol level was observed to be significantly higher (P<0.05) in dysmenorrheic females than in non dysmenorrheic control subjects. The significant difference in cholesterol concentrations of these two groups may also be attributed to several reasons, diet being the most important (Wong and Sunglee, 1994). Calorie-enriched foods as egg, meat, margarine has been found to increase total cholesterol concentration and consequently total body fat (Lane et al, 2000).

The role of exercise in reduction of cholesterol level in the body have been outlined (Haddock et al, 2000). It was observed that dysmenorrheic test subjects engage in minimal exercise whereas 50% of the control non dysmenorrheic subjects engage in regular physical exercise hence physical exercise can be employed as, a long term therapeutic measures since it reduces the level of total cholesterol and body mass ratio.

Menstrual disorders may be secondary to pelvic inflammatory diseases and other factors (Venturini et al, 1998). In as much as the existence of this infections may be secondary to dysmenorrhea the extent and effect of this relationship was never considered in this study.

CONCLUSION

From this study, it was observed that total cholesterol concentration is markedly higher in dysmenorrheic females than in non dysmenorrheic females. However the other parameters, body mass index, height and weight did not differ significantly ($P>0.05$) between dysmenorrheic females and non dysmenorrheic females. Thus we therefore conclude that high cholesterol level could be the major predisposing factor to dysmenorrhea in the subjects studied.

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