Original Article

Obesity, Adolescents and Gynaecological Problems

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Abstract

Objective: To determine the prevalence of various gynaecological problems among obese adolescents females.
Methodology: This observational cross sectional study was conducted over five months starting from June 2018 until October 2018 in KRL Hospital, Islamabad. A total of 46 female patients attending the gynae OPD who met the inclusion criteria were included in the study aged between 13 to 24 years and have no physical or mental health disease. These patients were provided with a questionnaire consisting of questions regarding the gynaecological problems (e.g., per vaginal discharge, menstrual irregularity, dysmenorrhea, and chronic pelvic pain) and advised laboratory investigations like serum fasting glucose, lipid profile and testosterone levels. The collected data after being documented on the performa was analyzed on SPSS 21.
Results: A total of 50 adolescent girls were enrolled in the study, out of which four lost to the follow-up, with the remainder 46 participants having an average age & BMI of 18.41 yrs & 30.25kg/m2 respectively. Subjects with BMI between 25 and 29.9 were younger (Mean age = 18.17), had less average waist circumference (94.88 vs 101.14), and had less frequency of biochemical and clinical function derangement except for dysmenorrhea which was prevalent among 45% of the patients in that group. Menstrual cycle irregularity was the most common feature affecting 80% of the enrolled population.
Conclusion: Adolescent girls having raised BMI to have a significant association between different gynaecological problems and deranged biochemical markers.
Keywords: Obesity, Adolescents, Gynaecological problems, Dysmenorrhea, Irregular menstrual cycle, Premenstrual syndrome, Pervaginal Discharge

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Introduction

Obesity is an epidemic of the 21st century and a major causative factor for many metabolic disorders. The prevalence of obesity in the last few decades has increased many folds resulting in the prevalence of worldwide obesity to be nearly tripled since 1975. In 2016, more than 1.9 billion adults (age greater than 18 yrs) were overweight due to unhealthy lifestyle, habits, and diet. Furthermore, about 340 million adults comprising of ages in between 5-19 years were overweight and obese. Obesity is known to be an independent risk factor for non-communicable diseases e.g chronic hypertension, Type II DM, Hyperlipidemias, and carcinomas.[1,2,3] Normal BMI range is 18.5-24.99 kg/m^2 as described by WHO.[8] Interestingly, central body

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fat is more strongly associated with adverse hormonal profiles.[21]

Adolescents is a transition period involving physical maturity, reproductive capability than psychological and social maturity and divided into early (10-13 yrs), middle (14-16yrs), late (17-19yrs), and very late (19-24yrs).[4]

The first demonstrable pathophysiological alterations associated with obesity are impairment in glucose metabolism and increased insulin resistance resulting in the following Lab abnormalities; Hyperinsulinemia, Hypertriglyceridemia, Imbalance between HDL and LDL, Hypercholesterolemia, hyperandrogenism. Fasting glucose, insulin and testosterone have a positive association with obesity. Obese women have two folds greater odd of having accelerated pubertal changes, irregular menstrual cycles, and early onset of polycystic ovarian syndrome compared to non-obese women.[5, 6]

PMS (premenstrual syndrome) is characterized by a complex set of symptoms which include physical, psychological and behavioral changes of varying severity. Nearly all adolescents' girls are affected by at least one of a symptom of PMS which affects her quality of life but limited studies have been done to see associations of obesity and PMS.[17]

The majority of studies are done on obesity, adolescents, and gynaecological problems (Polycystic ovaries and menstrual irregularity) while only a limited amount of data is found for other gynaecological problems like dysmenorrhea and premenstrual syndrome. Hence, it was rational to study the prevalence of different gynaecological problems and associated lab abnormalities among obese adolescent patients.

Methodology

This prospective cross-sectional study was conducted in the Department of Obstetrics and Gynecology KRL hospital Islamabad from June 2018 to October 2018 after taking approval from the hospital's ethical committee. Sample was collected by non-probability consecutive sampling. A total of 50 adolescent girls aged 13-24 years in OPD with gynecological issues and BMI more than 23 kg/m^2 were included in the study.

Informed Consent was taken from the participants after thoroughly explaining the procedure. To do so, a sample questionnaire was prepared and handed over to all the participants that asked for details about the gynecological issues faced by them in addition to their daily activity level as well as their diet choices in their daily routine. Then a brief examination was performed by the researcher trainee before performing a few lab tests.

The gynecological problems particularly asked were regarding presence or absence of Dysmenorrhea (painful menstruation with cramps in the lower abdomen), menstrual cycle irregularity (the interval between the beginning of one cycle to the beginning of the next cycle has a difference of more than 10 days at least twice a year), premenstrual syndrome (premenstrual anxiety, anger, fatigue, bloating, lower abdominal discomfort, breast tenderness) and vaginal discharge.

Lifestyle factors consisted of daily activities and food intake. The daily activities consisted of both indoor and outdoor activities. Regarding the Indoor, they were asked about the frequency of exercise, household work, watching TV, and mobile or laptop games. Outdoor activity questions were frequency of walk, exercise, outdoor gym, school and college games & sports. Dietary habits were assessed by questions regarding the intake of different foods. For example, fats containing questions include fried food like French fries/doughnuts/fast food, margarine/butter/cheese, processed snacks, milkshakes, parathas. Carbohydrates include honey/sugar, hard candies, chewing gum/chocolates, bakery products, jams, potatoes. Proteins include yogurt, chicken, eggs and high fiber diets include whole wheat roti, raw vegetables, and fruits.

The examination includes measuring height, weight and waist circumference. BMI was calculated by using the standard formula (weight in kg/height in m^2). BMI between 23 and 25 were considered overweight and above 25 were taken as mildly obese and above 30 severely obese. Waist circumference measured into the nearest centimeter at the level midway between lowest rib margin and the iliac crest in standing position using a soft measuring tape. Laboratory tests include serum assays of testosterone (in ng/dl units), blood sugar fasting (in mg/dl), and lipid profile. Reference ranges as advised by WHO. Values were considered abnormal if results are outside the reference ranges.

Statistical analysis: Data were analyzed using SPSS version 21. Analytic descriptive statistics were used to calculate frequencies and percentages.

Results

Owing to the absence of the literature on this research topic, the sample size was estimated conveniently keeping in view the hospital workload and patient's turnover. Participant's ages were found to be between 14-24 years. A total of 50 adolescent girls participated in the study. Out of these, four were either lost to follow up or they hadn't provided the test reports. So those were excluded from the study. The remaining 46 participants had an average age of 18.41 years and an average BMI 30.25kg/m^2. It is quite evident from figure A that the most prevalent biochemical anomaly affecting nearly two-thirds of the obese adult female patients suffering from gynaecological issues is high testosterone levels (n=31, 67.4%, p value = 0.001) which is highly significant. On the other hand, menstrual cycle irregularity is the most prevalent clinical abnormality prevailing in the population under study (n=37, 80.4.4%, p value = 0.086). Figure 1

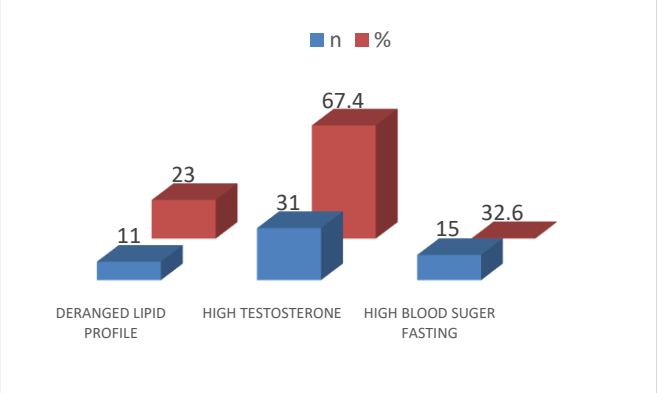

Figure 1. Biochemical Abnormalities.

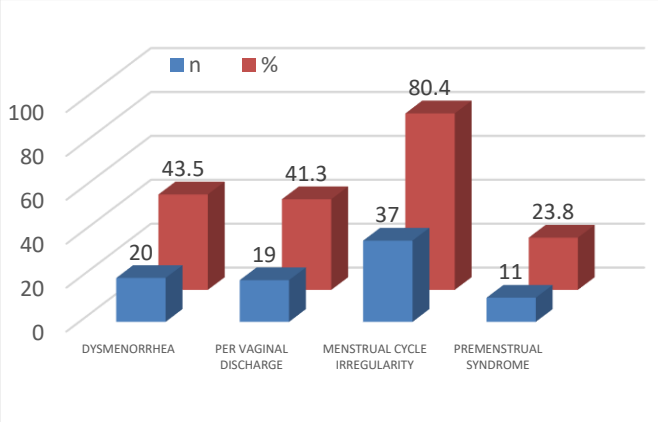

Figure 2. Group B-Clinical Abnormalities.

Inquiry about lifestyle showed lack of exercise either indoor or outdoor. Most of the participants admitted that they used to do only household work daily. Above 90% girls admitted that they watch television and play mobile or laptop games daily. This explains their lack of interest in physical activities. Only 4% of participants go to the gym regularly and do workouts under supervision of skilled personnel. (Table I)

Dietary habits of the study subjects were also assessed. Most of the participants used to take fried food (80.4%) and sugar (95.7%) daily. More than half of the girls take candies, chocolates, and bakery products daily. Protein intake was less in the form of chicken or meat. On the contrary good habits were regular intake of fruits, eggs and milk. Mix response was seen for butter, margarine and snacks. (Table II) Highly avoided diets include processed cheese and dry fruits.

Table I: Routine activities of the study participants

Indoor activities	Not usually (%)	Daily (%)	Once a week (%)	Twice a week (%)
Exercise	50	23.9	19.6	6.5
Household work	23.9	54.3	21.7	00
Watching tv	6.5	91.3	2.2	00
Mobile/laptop games	2.2	95.7	2.2	00
Outdoor activities				
Walk	60.9	26.1	10.9	2.2
Exercise	87	4.3	6.5	2.2
Outdoor gym	93.5	4.3	2.2	0
School/collage sports	91.3	6.5	2.2	0

Discussion

Pakistan is a developing country facing a double burden of obesity; contributing factors include environmental changes, urbanization (where female have higher proportion of overweight), lifestyle modifications, high density diets, decreased physical activity, lacking knowledge about obesity its high risk due to lack of education.[1]

Our study showed the majority of patients attending OPD average aged 18 years, of which 90 % have a sedentary lifestyle, while only 4% maintained a healthy lifestyle through physical activity. Most of the participants used to take fried food (80.4%) and sugar (95.7%) daily. Raised BMI >30 kg/m^2 associated with multiple gynecological problems the most important one include the metabolic syndrome (PCOS), leading to menstrual irregularity (90.9%) with less dysmenorrhea (40.9%).

45.65% of participants have BMI >30 kg/m^2. Deranged lipid profile (36.3%), raised testosterone levels (95.4%)

and impaired fasting glucose (36.3%) levels as compared to slightly overweight with BMI 25-29.9kg/m^2.

Table II: Dietary intake of participants

Dietary intake	Not usually (%)	Daily (%)	Once a week (%)	Twice a week (%)	3 or more times a week (%)
Fried food	4.3	80.4	8.7	6.5	0.0
Margarine/butter	37.0	23.9	28.3	10.9	0.0
Snacks (popcorn, chips, nimko)	26.1	37	30.4	6.5	0.0
Processed cheese	78.3	4.3	17.4	0.0	0.0
Milk shakes	56.5	32.6	8.7	2.2	0.0
Honey/sugar	0	95.7	4.3	0	0.0
Candies/chewing gum/chocolates	13	56.5	28.3	2.2	0.0
Bakery products	17.4	52.2	17.4	13	0.0
Jams/marmalades	54.3	15.2	13.0	17.4	0.0
Pasta/roti/paratha	37.0	50.0	4.3	8.7	0.0
Yogurt/milk	13.0	71.7	10.9	4.3	0.0
Chicken	6.5	4.3	71.7	17.4	0.0
Dry fruits	78.3	4.3	8.7	6.5	2.2
Vegetables	37.0	17.4	37.0	8.7	0.0
Fruits	4.3	84.8	4.3	2.2	4.3
Eggs	6.5	84.8	4.3	4.3	0.0

A study conducted by Leena M. et al. in 2015 shows a significant association between obesity and menstrual abnormalities (80.8% vs. 48.6% with p value 0.001). Abnormal menstruation was significantly associated with higher levels of testosterone, deranged lipid profile and higher fasting glucose levels.in comparison with multivariate risk factors strong association was found between waist circumference >89cm (normal value) which clearly defines central obesity and abnormal lab test. Results are similar to our study.

In contrast to the current study; study conducted by Khodakarami B.et al. in 2015 shows no significant effect of obesity on dysmenorrhea, participants having BMI < 30 have a greater frequency of dysmenorrhea but their results correspond with our study results however life style modifications have some better effect for prevention of dysmenorrhea.[6]

A study conducted that show statically significant relationship with BMI and menstrual irregularity (p <0.001), excessive vaginal discharge with or without foul smelling and itching (43%), abdominal pain (dysmenorrhea) (62%) which also supports our current study results.[8]

Our study shows linear strong association with BMI and Premenstrual syndrome, as a study conducted by Masho SW and Ashfaq R.[16,17] BMI was also positively associated with risk of specific physical and emotional symptoms, including swelling of the extremities, backache, abdominal cramping, diarrhea/constipation, mood swings, and food craving. A limited number of previous studies have evaluated the relationship between adiposity and premenstrual symptoms and PMS.

This is the only study which is conducted in Pakistan with small sample size showing a positive relationship between raised BMI, having greater deposition of central fat obesity with various gynaecological problems as only limited studies conducted taking into account only menstrual cycle irregularity. Due to lack of knowledge, education, male dominance society, women do not seek health care services properly as a large proportion of adolescents age groups females don't know about proper healthy diet, physical activity, obesity and its risks.

Conclusion

Pakistan is now suffering from an emerging epidemic of obesity**.** Adolescent girls having raised BMI have a significant association between different gynaecological problems with deranged biochemical markers.

STRENGTHS: The main strength of this study is that it is a randomized prospective trial, no other study conducted different gynecological issues concerning obesity only menstrual cycle irregularities were taken into account.

LIMITATIONS: The main limitation of this study is small sample size.

RECOMMENDATIONS: Immediate proper knowledge, awareness through public education campaigns, early prevention and control measures are important for controlling obesity should be taken.

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