Research Article

Knowledge of obesity and its effects on cardiometabolic and reproductive health in women

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ABSTRACT

Background: Obesity is following a raising trend in India. Being a major risk factor for various diseases, awareness should be raised among people regarding this issue. The objective of the study was to assess knowledge of obesity and its ill effects on cardio metabolic and reproductive health in women.
Methods: This was a prospective survey study done on women visiting gynecology OPD at Rajarajeswari Medical College and Hospital. 300 Subjects were randomly picked and were administered a questionnaire on the health risks of obesity, that is, its effect on cardio metabolic status, reproductive outcome in terms of infertility and spontaneous abortions and obesity related cancers such as endometrial and breast cancers. Height and weight measurements of the study subjects were measured.
Results: Subjects' age ranged from 19 to 47 years (mean SD: 28.72 ± 6.52). subjects who were aware that obesity increases the risk of various diseases were: diabetes (85.3%), blood pressure (88.7%), raised cholesterol levels in the blood(90.7%), infertility (84%), irregular periods (62%), abortions (44%),arthritis (86.7%), breast cancer (36%) , endometrial cancer (36.7%).
Conclusions: Women in our study have good knowledge about obesity and its effect on general health and cardio metabolic diseases, fair knowledge about reproductive outcomes. They are less aware of the association of obesity and sex hormone sensitive cancers like endometrial and breast cancers. Public education is needed to increase awareness of obesity and malignancy.

Keywords: Obesity, BMI, Knowledge

INTRODUCTION

Obesity is defined as abnormal or excessive fat accumulation that impairs the health, by WHO.[1] According to Recent guidelines of WHO, BMI greater than or equal to 25 is overweight, BMI greater than or equal to 30 is obesity.

Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of his height in meters kg/m.[2]

BMI provides the most useful population-level measure of overweight and obesity as it is the same for both sexes and for all ages of adults.

According to recent WHO global estimate, worldwide prevalence of obesity doubled between 1980 and 2014. The causes explained are an increased intake of energy dense foods and decrease in physical inactivity due to sedentary nature of work and change in modes of transport. In all WHO regions, women were more likely to be obese than men in 2014. The prevalence was highest in upper middle class income and lowest in lower income groups.

Obesity in India

Obesity has reached epidemic proportions in India in the 21 st century; with morbid obesity affecting 5 % of the country's population according to National Family Health Survey 3 (NFHS data).[2] India is following a trend of other developed countries because of increasing usage of unhealthy, processed food .There has been increase in average calorie intake per individual due to rising middle class incomes. According to NFHS data the percentage of women aged 15 to 49 who are overweight or obese increased from 11 % in NFHS 2 survey to 15% in NFHS 3 survey.

Furthermore, under nutrition and overweight /obesity are both higher for women than men .This dual disease pattern in women may have an endocrine basis, but more probably has its roots in societal and cultural mores, which prevent women from leading a healthy lifestyle. The percentage of women in India who are overweight / obese is highest in Punjab 37.5%, followed by Kerala 34% and Goa 27% all of which are relatively richer states.[2]

Following increase in adult obesity, the proportion of children and adolescents who are overweight /obese have also been increasing.[3] The most important consequence of childhood obesity is its persistence into adulthood and all its health risks. The health risks include cardiovascular diseases, diabetes, osteoarthritis and some sex hormone sensitive cancers.[3] Another study done on childhood obesity revealed that the trend of adolescent overweight and obesity is a worrying phenomenon in the national perspective. The findings of the study strongly advocate the need to implement interventional measures for preventing adolescent overweight and obesity.[4]

Aside from long term risks, obesity poses immediate threats for young women including sub fertility and adverse early and late pregnancy outcomes.

Scientist have identified a SNP (single nucleotide polymorphism) named rs12970134 to be mostly associated with waist circumference.[5] In this study more than 2000 individuals of Indian origin participated and the aforementioned SNP is highly prevalent in this group. People in Asia tend to develop diabetes with lesser degree of obesity at younger ages, suffer longer with complication of diabetes and die sooner than other people in other regions.[6]

METHODS

300 women attending gynaecology outpatient department were given Questionnaire which contained current data on the obesity and its health effects on cardiac status, diabetes, blood pressure, infertility, abortions, cholesterol levels in blood, arthritis, menstrual irregularities, and sex hormone sensitive cancers like endometrial and breast cancers. Verbal and informed consent was taken from subjects who participated in the study. Demographic data included age, education, house hold income status, self-perception about their current weight and height. Age of participants ranged from between 19 to 47 years.

Height was measured in centimetres. Weight was measured in kilograms with the help of an electronic weighing machine. Measured height and weight were converted to metric units and participants' BMI was calculated. Participants were categorized into BMI groups based on the WHO classification.

Statistics

The $\chi 2$ test was used to determine the interaction between the demographic variables and patients' knowledge of the effect of obesity on specific conditions (as well as the interaction between patient BMI classification and demographic variables.

RESULTS

This study aimed to assess the knowledge of BMI and effects of obesity on general health, cardio metabolic, reproductive outcomes mainly infertility and spontaneous abortions, obesity related cancers, among women visiting gynaecology OPD of Rajarajeswari Medical College and Hospital.

Table 1: Showing demographic data of study population.

Demogrpahic data	No of patients	Percentages
Age		
19-20	24	8.0
21-30	184	61.3
31-40	78	26.0
41-50	14	4.7
Mean SD 28.7+/-6.52		
Education		
No education	34	11.3
1 to 10th	150	50
Intermediate	82	27.3
Graduate	26	8.7
Post graduate	8	2.7
Socioeconomic status (modified kuppuswamys classification)		
Lower class (v)	40	13.3
Upper middle class (ii)	244	81.3
Upper class (i)	16	5.3
BMI of patients		
< 25	161	53.7
25-30	111	37
>30	28	9.3

Demographic data is shown in Table 1. 300 women were enrolled in the study. Age of the patients varied from 19 to 47 years (mean ± SD: 28.72 ± 6.52 years). According to Modified Kuppuswamys socioeconomic classification, 81.3% of them belonged to upper middle class (class 2) which formed the majority of study population. 53.7% of the subjects had a normal BMI, 37% were overweight and 9.3% were obese. 16.7% of the study population had studied upto seventh standard, 33.3% of them upto tenth standard, 27.3% of them upto intermediate (class eleventh and twelfth). Only 8.7% and 2.7% of women were graduates and post graduates respectively. 11.3% of women were not educated at all.

In our study population, education level correlated with the knowledge of obesity with respect to following conditions: diabetes (p = 0.073), hypertension (p = 0.005) and abortions (p = 0.045).Education level had no correlation with knowledge of obesity regarding infertility (p = 0.233), endometrial cancer (p = 0.268), breast cancer (p= 0.153).

Income of the participants had no significant effect on knowledge of obesity with respect to infertility (p=0.721), diabetes (p = 0.479) and hypertension (p = 0.716).

Knowledge of BMI

It was shocking to know that none of the participants in the study population knew about Body Mass Index (BMI). Though 8.7% of women were graduates and 2.7% of them were post graduates in the study group, none had an idea as to what BMI was.

Knowledge about obesity and its health risks

Figure 1 shows the pictorial representation of knowledge of patients with respect to various health risks of obesity.
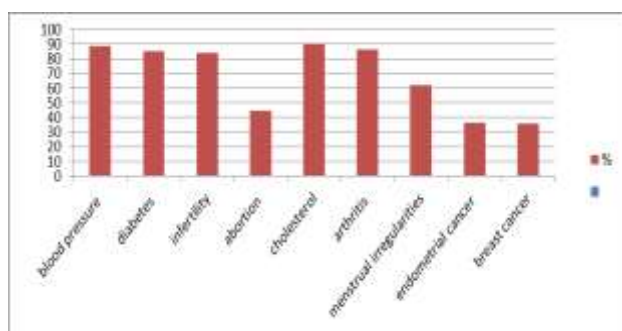

Figure 1: Pictorial representation of knowledge of patients with respect to various health risks of obesity.

We asked the patients directly as to whether obesity increases the risk of conditions and the participants answerer in 'Yes' or 'No' format. 266 (88.7%) and 256 (85.3%) of women answered in affirmative for raised blood pressure and diabetes respectively. 260 (86.7%) gave positive answers for arthritis. 272 (90.7%) of them were in favour of obesity as one of the cause for raised cholesterol levels in blood. These results show that majority of women were aware of cardio metabolic risks associated with obesity.

The following percentages of women were aware that obesity is a risk factor for the following conditions: menstrual irregularities (62%), infertility (84%), and abortions (44.7%).

When asked about effects of obesity on cancers, 36.7% and 36% of patients answered 'yes' for endometrial and breast cancers respectively.

DISCUSSION

Our study aimed to assess the knowledge of obesity and its health issues in women attending gynaecology OPD.

Our study results are correlating with studies done prior in terms of knowledge of obesity and its effect on general health and cardio metabolic diseases. Study done by Cardozo et al shows the following results. Percentages of women who were aware that obesity increases the risk are: diabetes (79.1%), high blood pressure (74.2%), heart disease (73.3%).[7] In another study by Cardozo, Eden R., et al the percentages of women who were aware that obesity increases the risks are: high blood pressure (94.7%); diabetes (93.3%); heart disease (92.7%); high cholesterol (92.0%).[8] These percentages are correlating with our study with respect to diabetes (85.3%), high blood pressure (88.7%), raised cholesterol levels (90.7%). This indicates that irrespective of education status women are well aware of obesity and its ill effects on cardio metabolic diseases.

Participants in our study had a fair idea about relationship between obesity and infertility. About 84 % of women in the study population knew that obesity is one of the modifiable risk factor in infertility and its treatment outcome. When asked about source of knowledge, counselling by health providers and media (television programs on infertility) were said to have influenced the patient's knowledge regarding this issue. In this aspect our study results are superior to the study done by Beavis, Anna L et al wherein only 35% of women knew about effect of obesity on infertility. Our study result is comparable to study done on infertility patients, about their knowledge of obesity and its impact on infertility by Cardozo Eden R et al in which it was about 82.7%.[8]

Majority of the infertility patients who participated in the study were suffering from polycystic ovarian syndrome. Obesity is frequently present in patients with polycystic ovary syndrome (PCOS) and plays an important role in the pathogenesis of the metabolic, endocrine, and reproductive abnormalities associated with this syndrome. According to Panidis Dimitrios, et al lifestyle changes; including diet, exercise and behavioral

modification; appears to improve the metabolic and reproductive abnormalities of overweight and obese patients with PCOS. Therefore, lifestyle changes appear to represent the first-line management for all overweight and obese patients with PCOS.[9]

In the study population, 44.7% of women believed that obesity can be a risk factor for spontaneous abortions. This percentage is almost comparable to study done by Cardozo, Eden R, et al where in it was about 37.5%. This study was done to assess the knowledge of obesity on reproductive health in urban women, USA. Another similar study done by Cardozo et al on infertility patients showed a slightly higher percentage of patients who were aware of the risk, about 60.7%. This might be because women attending infertility clinics are better aware of obesity and its risks, during counselling sessions by health providers, than general population. A study done by Jung, Sun J, et al revealed that pre-pregnancy BMI at ages 18–20 years was associated with a higher likelihood of spontaneous abortion in underweight or obese women, using the Asian BMI classification. Obese women had a higher likelihood of spontaneous abortion at earlier maternal ages, whereas underweight women had a higher likelihood of spontaneous abortion at typical or later ages.[10] In a recent study, done by Andraweera, Prabha H, et al it has been found that the obesity-related FTO rs9939609 single nucleotide polymorphism associates with recurrent miscarriage. The single nucleotide polymorphism may be useful in predicting the risk of recurrent miscarriage.[11]

Study population is not very much aware of the association of obesity and sex hormone sensitive cancers like endometrial and breast cancers. Less than half women who participated in the study knew about the association, about 36% only. Our study results correlate with study done by Beavis Anna L, et al where in significantly fewer women were aware of the association of obesity with cancers. In their study overall, (37.4%) women correctly identified obesity as a risk factor for endometrial cancer, (34.4%) for breast cancer.[12] This shows that in the present study population, the scenario is such that awareness of the risks of obesity on cardio metabolic outcomes is reaching even those individuals with less formal education but public education is not addressing the risks of obesity on cancers.

Endometrial cancer is the third commonest gynaecological cancer in developing countries like India where cancer cervix holds the first place.[13] In a recent study done in China, by Gao Jing, et al which aimed to provide data on the impact of known risk factors on endometrial cancer burden, an estimated 16.9% of cancer cases were attributed to overweight and obesity, 5.23% to physical inactivity and 8.39% to meat intake.[14] Among modifiable lifestyle factors, overweight and obesity accounted for the largest proportion of risk factors for endometrial cancer by more than 1/3rd.

Environmental factors influence breast cancer incidence and progression. According to James FR, et al high body mass index (BMI) is associated with increased risk of post-menopausal breast cancer and with poorer outcome in those with a history of breast cancer.[15] BMI cannot actually distinguish lean mass from fat mass and so individuals with same BMI can have different body composition. We always think high BMI as excess adiposity (overweight/obesity). But we actually do not know as to what aspects of body composition lead to poorer outcome in breast cancer patients with high BMI. Further research is required to better characterize the relation of body composition to breast cancer.

In a recent retrospective analysis performed using data from SUCCSESS- A trial in early breast cancer patients, it was concluded that severely obese patients (BMI > 40) had poorer prognosis in terms of disease free survival and overall survival compared to normal/ underweight patients. However overweight patients did not differ from underweight/normal weight patients with regard to the same parameters.[16]

CONCLUSION

Obesity is undoubtedly a major healthcare challenge, because of its associated comorbidities and impact on female health. Obstetricians and gynaecologists need to always consider a woman's BMI when considering investigation and treatment strategies, risks associated with treatment and prognosis. Women of reproductive age may provide a unique opportunity for intervention, as they are open to behavioural modification. An important first step is for women's health care providers to make a commitment to inform patients about their weight status and educate them on obesity as a major modifiable risk factor for so many preventable diseases including cancers. As the old adage goes, 'prevention is better than cure' so we should continue to promote a healthy lifestyle and aim to prevent the increase in the prevalence of obesity. Maternal education status is main determinant of the extent of knowledge and this should be considered when designing education campaigns. Looking at the current trend of raising obesity in our country, urgent action is needed and advocacy for lifestyle changes is the first step. India should review and implement interventions, and take a comprehensive and integrated public health approach.

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