Original Article

High prevalence of obesity among nursing personnel working in tertiary care hospital

M. Aslam, A.A Siddiqui, G. Sandeep, S.V. Madhu*

Department of Endocrinology, Centre for Diabetes Endocrinology & Metabolism, University College of Medical Sciences (University of Delhi) & GTB Hospital, Delhi 110095, India

ARTICLE INFO

ABSTRACT

Aim: To find out the prevalence of obesity and glucose intolerance among nurses working in tertiary care hospital.

Methods: Study was conducted in 496 apparently healthy females comprising two groups. Group B had 290 nurses and control group A had 206 age matched female subjects of general population. Detailed performa was filled which included anthropometry, systemic examination and other details. Fasting plasma glucose was done followed by oral glucose tolerance test (OGTT). Subjects with body mass index $\geq$23 kg/m^2 were categorized as 'overweight' and $\geq$25 kg/m^2 as 'obese' as per criteria for Asian Indians. Women with waist circumference of $\geq$80 cm were categorized as 'centrally obese'.

Results: Mean age of subjects in groups A and B was 40.45 ± 8.64 years and 40.50 ± 6.96 years respectively. Significantly higher number of nurses (80%) were overweight or obese compared to controls (59.71%, P = < .001). Similarly, central obesity was significantly higher in nurses (82.07%) compared to controls (67.96%, P = <.001). The prevalence of glucose intolerance (prediabetes and newly detected diabetes) was significantly higher in controls compared to nurses (45.63% vs 29.66%, P < .001).

Conclusion: Every four out of five nurses working in tertiary care hospital have overweight/obesity and central obesity. Despite this they have lower rates of glucose intolerance.

1. Introduction

Obesity is one of the most common, yet among the most neglected, public health problem across the world. The incidence of overweight and obesity has increased globally over the past three decades [1] and around 700 million people in the world are obese [1]. According to world health organization data, nearly 2.8 million individuals die each year due to overweight or obesity [2]. Further, it has also been reported that mortality rate increases by twelve fold in obese persons when compared to persons of normal weight [3].

Studies have also shown that individuals with higher body mass index, a measure of obesity, are at increased risk of developing morbidities associated with obesity [4–7]. The etiology of obesity is multi-factorial. Obesity can be an outcome of genetic defects, unhealthy diet pattern, sedentary life style, medication, hormonal imbalance, infection, odd and prolonged working hours and stress. Higher prevalence of obesity has been particularly reported from urban areas where several of these factors i.e., unhealthy diet pattern, sedentary life style, odd and prolonged working hours and stress are common and therefore urban population is at increased risk of developing obesity and obesity associated diseases like diabetes [7], hypertension [5], dyslipidemia [6,8] cardiovascular disease [6,8] and even some cancers [4,9].

Healthcare professionals particularly nurses are also at increased risk of developing obesity and associated diseases as they are exposed to odd and prolonged working hours, work stress, infection, unhealthy diet pattern. Despite the increased risk of obesity and associated disorders in nurses, very few studies have been carried out in this area. However, most of these studies have reported higher prevalence of obesity and metabolic syndrome in nurses [10–16]. The prevalence of obesity in these studies varied from 40% to 81% whereas no such study has been carried out from India.

The present study was therefore carried out to find out the prevalence of overweight, obesity, central obesity and glucose

intolerance among nursing personnel working in a tertiary care hospital and to compare them with women of control group.

2. Subjects

The present cross sectional study was conducted in 496 apparently healthy female subjects in the age group of 20–60 years comprising two groups. Group B consisted of 290 female nursing professionals working in a tertiary care hospital of Delhi and control group A had 206 age matched female subjects of general population from the same geographical area. The study was approved by Institutional Ethics Committee-Human Research, University College of Medical Sciences and GTB Hospital, Delhi, India. The study was carried out as per the guidelines of the institutional ethics committee.

3. Materials and methods

Pregnant or lactating women, alcoholics, smokers, known case of diabetes, those with history of any chronic illness and those taking any type of medications which could affect glucose or lipid metabolism were excluded from the study. A written informed consent was obtained from all the study subjects. Detailed instructions were given to all the subjects who were asked to come on a prefixed day at 9 am after a minimum of 8 h fasting for oral glucose tolerance tests (OGTTs). On the scheduled day, body weight was recorded in fasting state using digital electronic weighing machine. A detailed performa was filled which included anthropometry, systemic examination and other details and fasting blood sample was drawn for fasting plasma glucose. After fasting blood sampling, 75 gm anhydrous glucose was given and blood sample was drawn again for 2 h postprandial plasma glucose. Also, lipid profile and fasting serum insulin were done in some of the subjects in each group.

Subjects who had body mass index (BMI) $\geq 23\,kg/m^2$ were categorized as 'overweight' and $\geq 25\,kg/m^2$ as 'obese' as per obesity criteria for Asian Indians. Women with waist circumference of $\geq 80\,cm$ were categorized as 'centrally obese'. On the basis of OGTT, subjects were classified as normal glucose tolerance (NGT), impaired fasting glucose (IFG), impaired glucose tolerance (IGT) and newly detected diabetes mellitus (NDDM) based on American Diabetes Association criteria.

Plasma glucose was estimated by glucose oxidase-peroxidase methods (Accures kit, Accurex Biomedicals, India). Serum total cholesterol and triglyceride were estimated by commercially available kits (Merck-Labkit, Spain). The HDL was estimated by direct method (Accurex Biomedicals, India). Very low density lipoprotein (VLDL) and LDL were calculated as follows; $VLDL = [TG/5]$ and $LDL = [CHL - (HDL + VLDL)]$.

Statistical Analysis: Unpaired *t*-test was used to compare continuous variables between the two groups. Binomial variables were compared by chi-square test. All the statistical analysis was done on SPSS 20.0. Data was considered significantly different if P value was <.05.

4. Results

The mean age of subjects in groups A and B was 40.45 ± 8.64 and 40.50 ± 6.96 years respectively. Body mass index (BMI) was found to be significantly higher in group B subjects (nurses) compared to subjects of control group A (Table 1). Significantly higher percentage of nurses were found to be overweight or obese (BMI $\geq 23\,kg/m^2$) in group B compared to control group A (Fig. 1). Obesity (BMI $\geq 25\,kg/m^2$) alone was also found to be significantly higher in nurses compared to controls (Fig. 1). Also, central obesity (waist circumference $\geq 80\,cm$) was found to be significantly higher in nurses compared to controls (Fig. 1). Data was sub-analyzed further by excluding subjects with 'positive' family history of diabetes from both study groups, the prevalence of overweight plus obesity and central obesity was also found to be significantly higher in nurses compared to controls (Fig. 1).

Mean systolic and diastolic blood pressure and pulse rate were found to be comparable between both the groups (Table 1). Significantly higher percentage of nurses had positive family history of diabetes and family income compared to controls (Table 1). Eighty seven percent of the women from general population were housewives.

Prevalence of glucose intolerance (impaired fasting glucose, impaired glucose tolerance and newly detected diabetes mellitus) was found to be significantly higher in controls compared to nurses (45.63% vs 29.66%, P < 0.001). Percentage of subjects with prediabetes (IGT ± IFG) and newly detected diabetes mellitus was also found to be significantly higher in controls compared to nurses (34.47% vs 24.14%, P = 0.01 and 11.17% vs 5.52%, P = 0.03 respectively). There was no significant difference in fasting insulin, total cholesterol, triglyceride, HDLc, LDLc or VLDLc between the two groups (Table 2).

5. Discussion

The present study found obesity and central obesity in four out of every five nurses working in a tertiary care hospital. This was significantly higher than in age matched women in the control group in which obesity was seen in three out of every five and central obesity in two thirds of them. However, glucose intolerance was observed in a significantly lower percentage of nurses compared to controls.

Our study confirms the findings of several earlier studies from different parts of the world outside India which have reported a higher prevalence of obesity in nurses ranging from forty percent to eighty one percent [10–16]. However, most of these studies have reported lower prevalence of obesity compared to present study. These studies have reported prevalence of overweight/obesity varying from forty percent from Iran [12], forty three percent from

Table 1
Anthropometry, hemodynamic and demographic data of study subjects.

Variable	Group A	Group B	P-value
Age (years)	40.45 ± 8.64	40.50 ± 6.96	P = .93
BMI (kg/m^2)	24.77 ± 5.37	26.40 ± 3.82	P < .001
SBP (mmHg)	127.30 ± 12.00	126.10 ± 12.50	P = .28
DBP (mmHg)	79.57 ± 6.24	80.64 ± 6.88	P = .07
Pulse (BPM)	80.40 ± 7.45	79.88 ± 7.32	P = .43
Positive Family history of diabetes (%)	24.01	36.93	P < .001
Family income (INR/year)	64155 ± 62205	302185 ± 114140	P < .001

n = 206 for group A and n = 290 for group B.