

Prevalence of Obesity and Associated Comorbidities among the Inpatient Population in a Colombo Suburb an Hospital

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Abstract:

Background: Obesity and related comorbidities are among the leading noncommunicable health concerns in developed countries. Rapid urbanisation leading to sedentary life style and unhealthy dietary habits has generated similar health concerns in developing countries as well.

Objectives:

1. Assess the prevalence of obesity among medical inpatients of a Colombo Suburb Hospital (ward 12, Sri Jayawardenepura General Hospital)
2. Identify demographic patterns, risk factors and obesity associated comorbidities (HT, DM, CVD, OA)

Methodology:

Clinical and investigation findings were recorded from patients with body mass index (BMI) > 23kg/m² and subdivided in to 5 groups according to their BMI as, 1: BMI 23- 24.9 (healthy upper level), 2: BMI 25-29.9 (over weight), 3: BMI 30-34.9(moderate obesity), 4: BMI 35- 39.9 (severe obesity) 5: BMI >40 (very severe obesity). Prevalence of metabolic syndrome, clinically detectable fatty liver and Non Alcoholic Steatohepatitis (NASH) was determined.

Results:

A population of 110 patients with male: female ratio of 1:1.9 was studied. Metabolic syndrome was detected in all 5 groups and the highest prevalence (76%) was seen in group 3. Group 1 showed second highest of 55%.

Fatty liver disease was highest in group 2 (22.8%). Group 1 and 3 showed presence of fatty liver in 20% and 16% respectively.

NASH was predominant in group 3(16%) while group 1 and 2 had 10% and 7.01% cases.

Conclusion:

Obesity and related health issues in Sri Lankan urban community appears not different from that of Western community. Therefore, health education focused on lifestyle modifications, early detection of high risk groups and screening for comorbidities need to be strongly addressed.

(Abbreviations: BMI- Body Mass Index, NASH- Non Alcoholic steatohepatitis, HT-Hypertension, DM- Diabetes Mellitus, CVD- Cardio Vascular Disease, OA- Osteoarthritis)

Introduction

Obesity and overweight has turned out to be an epidemic in developed countries. It is not just a single health problem as there are several other comorbidities associate with it. According to the literature it is noted that more than one third of the adult population in developed countries are obese while nearly 65% of adults are considered to be either overweight or obese.

Obesity is the second leading cause of preventable deaths worldwide. Heart disease, high blood pressure, insulin resistance and diabetes, stroke, obstructive sleep apnoea, osteoarthritis are some of the related health conditions of excess body weight in adults. These non communicable medical conditions increase the incidence of recurrent hospitalisation and premature deaths. It has been shown that a significant escalation of health care cost has occurred due to these medical conditions.

Metabolic syndrome and non alcoholic fatty liver disease are two strong associations of overweight and obesity. Furthermore, obesity and overweight have great effect on the quality of life of an individual. A situation of functional inability created by increasing body weight automatically leads to low productivity and emotional and psychological disharmony.

Health impact of obesity is widely discussed in developed countries and many measures have been taken to address these issues. Marked shift of the life style from a physically active state to a sedentary nature, in association with economic growth has created similar concerns in South Asian countries as well. Questions are raised on whether if Sri Lankan adults do have relatively high prevalence of overweight and abdominal obesity. Our effort is to gain a broad knowledge of the prevalence of obesity and its associations among Sri Lankan urban population and to generate public awareness of the situation.

Research design and method

An inpatients population was selected as the study group due to easy accessibility for assessment tools and as this is a first group come in to contact with health professionals. Sri Jayawardenapura Teaching Hospital is one of the main health care providers for the urban population in and around Colombo city. Medical ward 12 was selected as the main resource unit. All the patients admitted to the unit from 1st of February to 30th of April 2006 were weighted with 'Seca' medical balance beam scale and their heights were recorded in meters. The body mass index (BMI) was calculated accordingly and patients with BMI > 23 kg/m² were assessed further with an interviewer administer questioner which include demographic data and past medical information. Patients consent was obtained for blood investigations and ultrasound scan. The total number of patients' admitted to medical ward 12 during this period was calculated using mean admission rate and was 1800. Patients admitted to the unit more than once was counted once only.

Results:

The study population included 110 patients .The results were analysed under 5 patient groups ac-

ording to BMI values. **Group 1:** BMI 23- 24.9 (health upper level), **Group 2:** BMI 25-29.9 (over weight), **Group3:** BMI 30-34.9(moderate obesity), **Group 4:** BMI 35- 39.9 (severe obesity) **Group 5:** BMI >40 (very severe obesity).

Age of selected patients varied from 14 to 83 years and included a male to female ratio of 1:1.9. The study group included all ethnic groups in Sri Lanka. However, the majority was Sinhalese (68.2%) with Tamil, Muslim and Burgher composition of 14.5%, 9.1%, and 8.2% respectively. Undesired weight is more prevalent in unemployed (54.5%), married (86.4%) patients than regularly working, unmarried patients. Study group included 46.4% females who had children and 38.2% of them multifarious having had more than 2 children. Prevalence of overweight and obesity in different income groups is, low income (<15x10³LKR) 34.5%, middle income (15-50x10³LKR) 49.09%, upper income (>50x10³ LKR) 9%.

Table 1: Results summary (group percentages are given in brackets)

BMI	Total no of patients	Metabolic Syndrome		Clinical features of fatty liver (%)	Possible NASH (%)	Common Co morbidities (%)			
		Male (%)	Female (%)			HT	DM	CVD	OA
23-24.9 (the upper limits of normal BMI)	20	2 (10)	9 (45)	4 (20)	2 (10)	8 (47)	10 (50)	2 (10)	2 (10)
25-29.9 (over weight)	57	5 (8.8)	23 (40.3)	13 (22.8)	4 (7.01)	23 (40.3)	18 (32)	10 (17.5)	6 (10.5)
30-34.9 (moderate obesity)	25	3 (12)	16 (64)	4 (16)	4 (16)	13 (52)	5 (20)	11 (44)	8 (32)
35-39.9 (severe obesity)	04	0	2 (50)	1 (25)	0	1 (25)	1 (25)	0	1 (25)
BMI >40 (very severe obesity)	04	3 (75)	1 (25)	All consume alcohol	0	3 (75)	2 (50)	2 (50)	3 (75)
total	110	13	51	22	10	48	36	25	20

Group 1(BMI 23-24.9): 18% of the study population belonged to this healthy upper level of weight and they included 20- 89 year olds. In this group 45 % of female and 10% of males were found to have metabolic syndrome. Fatty liver was detected in 20% of them while possible Non Alcoholic Steatohepatitis (NASH) was diagnosed in 10 % of them. Diabetes mellitus was the commonest comorbidity seen in this group and it was detected in 50 % of them while there was 47% of hypertension and 10% of coronary vascular disease and 10% osteoarthritis patients were found in this group.

Group 2(BMI 25 – 29.9): 51.8 % of the study population belonged to this over weight group. Age distribution was from 12- 89 years. Significantly this group included 5 patients less than 16 years of age. Metabolic syndrome was diagnosed in 40.3 % females and 8.8 % males. Metabolic syndrome was diagnosed in 22.8% of them while and NASH was possible in 7.01 % of them. Hypertension (40%) was the most common co morbidity in this group followed by diabetes mellitus (32%), coronary vascular disease (17.5%) and osteoarthritis (10.5%).

Group 3(BMI 30- 34.9): This moderate obesity group included 22.7% of study population. Features of metabolic syndrome were present in 76 % of patients and out of them 64 % were females. Enlarged liver was clinically detected in 16 % of patients and all of them were noted to have features of NASH. Hypertension (52%) was the commonest co morbidity in this group while second common was cardiovascular disease (44%). Higher prevalence of osteoarthritis (32%) exceeding diabetes mellitus (20%) was noted in this group.

Group 4 (BMI 35-39.9) Number of patient in this group was small (3.6%). Metabolic syndrome was noted in half of the group and included only females .The patient who had features of fatty liver did not have NASH.

Group 5 (BMI >40) This very severe obesity group included 3.6% of study population with male: female ration of 3:1. Since all patients in this group consumed alcohol, the diagnosis of metabolic syndrome and NASH is disregarded. Among the comorbidities, hypertension and osteoarthritis were predominant and seen in 3 out of 4 patients, while diabetes mellitus and coronary vascular disease were found in 2 patients each.

Discussion

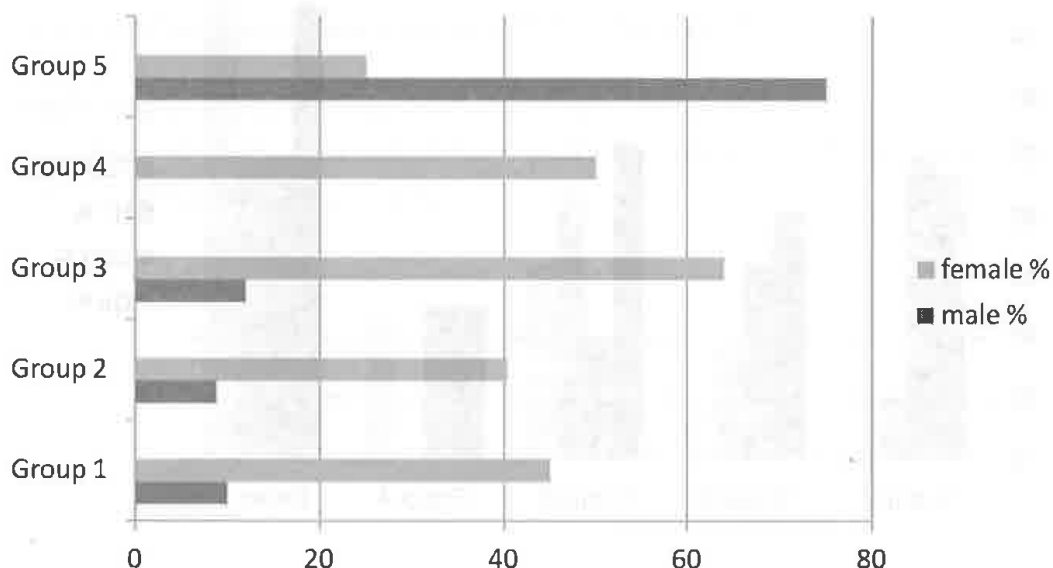
Metabolic syndrome was increasingly detected in healthy people and shows an association with overweight and obesity. Many reports show high prevalence of metabolic syndrome in South East Asia.

Metabolic syndrome diagnosis

Criteria	ATP III criteria 2004	Proposed criteria for South East Asians
	> Than 3 of the following	Fasting hyperinsulinaemia and 2 of the following
FBS (ug/dl)	≥ 100 or T2DM or treatment	IFG, IGT or T2DM or treatment
Waist circumference(cm)		
males	≥ 102	87 or BMI 23
females	> 88	82 or BMI 23
Blood pressure (mmHg)	≥ 130/85 or treatment	≥ 130/85 or treatment
Triglycerides (mg/dl)	≥ 150 or treatment	≥ 150 or treatment
HDL (mg/dl)		
Male	< 40	< 40
Female	< 50	< 50

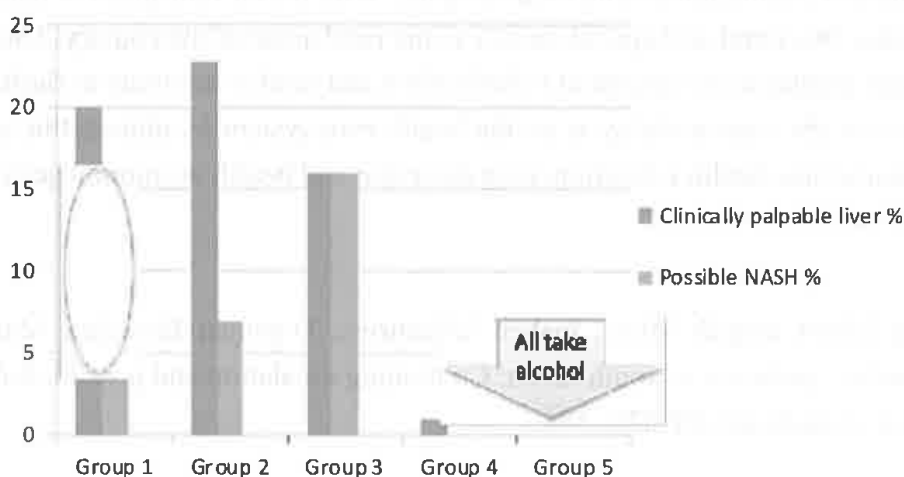
The diagnosis criteria laid down by NCCP ATP III for the diagnosis of metabolic syndrome has overlooked the lower body built of Asian population. There are continuing suggestions to include modified waist circumference for diagnosis of metabolic syndrome in this region. Thus the WHO criterion which includes lower values for waist circumference (90 cm for men and 80 cm for women) is used to evaluate results of this study.

Figure:1 Prevalence of metabolic syndrome



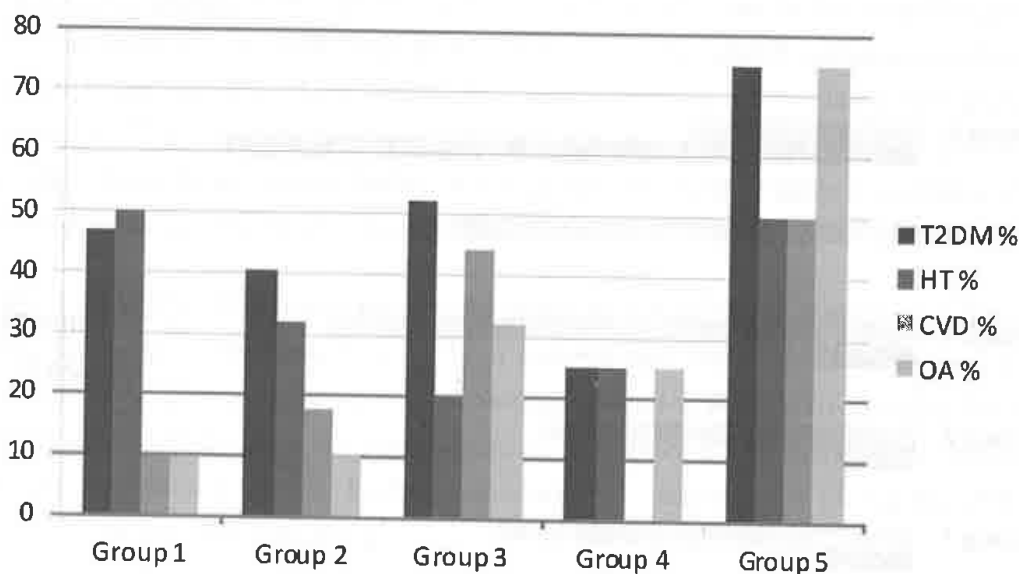
Even though metabolic syndrome was noted in all 5 groups, group 3, moderate obesity group showed the highest prevalence (76%). Group 1, healthy upper level weight patients, had second highest prevalence (55%) of metabolic syndrome while group 2, over weight patients had 49.1% prevalence. (Figure 1). Metabolic syndrome is more commonly detected among females of overweight and early stages of obesity, while higher male prevalence is seen at the upper extreme point of obesity. This pattern has been highlighted even in researches carried out in European countries. This will predict possible health related hazards encountered by them to occur in our population in the future.

Figure: 2 Non alcoholic steatohepatitis (NASH)



Group 3, Moderate obesity patients showed the highest prevalence of NASH (16%) while group 1 and 2 also included significant numbers. However, the significance of prevalence of NASH in group 4 and 5 cannot be commented due to less number of patients in these groups. (Figure 2)

Figure 3: Prevalence of comorbidities



Upper limit healthy weight patient group shows significant existence of hypertension and type 2 diabetes mellitus. These figures indicate a requirement of extra vigilance in healthcare professionals to detect these conditions in the public when they come in to contact with healthcare systems. Two major risk factors for coronary vascular disease, hypertension and type 2 diabetes mellitus are seen in more than 25 % of patients in all four groups. This predicts additional burden of coronary care for the health system in the future.

Conclusions

This study highlights the trends of overweight and obesity related noncommunicable disease states in a Colombo suburb population and its future impact. With the current speed of demographic transition in Sri Lanka, this trend will spread rapidly to the rural areas of the country. There is a need for large scale similar studies to be carried out in both urban and rural community to further evaluate this tendency. However, the responsibility is on the health care system to address this evolving health disaster with appropriate health education, case detection and health promotion activities.

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