

Prevalence of generalised obesity and abdominal obesity among medical students of PK Das Institute of Medical Sciences, Palakkad

Nimisha V¹, Santhosh Viswan^{2*}, Jagathlal P C³

¹Assistant Professor, ²Associate Professor, ³Professor and HOD, Department of Biochemistry, PK Das Institute of Medical Sciences, Vaniamkulam, Palakkad, Kerala, INDIA.

Email: santhoshviswan13@gmail.com

Abstract

Background and Objectives: Obesity is one of the most common preventable and neglected diseases. This study was aimed to find prevalence of Generalised Obesity and abdominal obesity based on Asia pacific classification of BMI given by WHO among medical students of PK Das Institute of Medical Sciences. **Materials and Methods:** This study was conducted among medical students above the age of 20 years in PK Das Institute of Medical Sciences from December 2016 to April 2017. The sample size was calculated to be 85. WHO Asia Pacific guidelines were used to define Generalised obesity (BMI \geq 25kg/m) and abdominal obesity (AO, waist circumference \geq 90 cm). **Results:** 25.9% male students were found to have generalised obesity compared to 13.8% female students. In case of abdominal obesity, 14.8% male students were found to be obese compared to 27.5% female students. **Interpretation and Conclusion:** A higher prevalence of generalised obesity and abdominal obesity among medical students compared to childhood and adolescent obesity shows a need to intervene with preventive aspects at the curricula level of schools and colleges keeping the positive and negative aspects of early diagnosis.

Key Words: obesity, Palakkad.

* Address for Correspondence:

Dr. Santhosh Viswan, Associate Professor, Department of Biochemistry, PK Das Institute of Medical Sciences, Vaniamkulam, Palakkad, Kerala 682522, INDIA.

Email: santhoshviswan13@gmail.com

Received Date: 11/05/2018 Revised Date: 14/06/2018 Accepted Date: 22/07/2018

DOI: <https://doi.org/10.26611/1002721>

Access this article online

Quick Response Code:



Website:

www.medpulse.in

Accessed Date:
04 August 2018

INTRODUCTION

Obesity is characterised by excessive accumulation and storage of fats in the body. Body Mass Index (BMI) is currently being used as an anthropometric measurement to interpret the body fatness, based on which people are classified into groups. The extremes are interpreted as unhealthy.¹ The classification given by WHO for BMI which was originally made considering the Caucasian population cannot be applied on Asians because of less

skeletal muscle mass and pelvic skeleton dimensions seen in Asians, which also includes those who have suffered childhood malnutrition.^{2,3} Moreover Asians are found to have excess body fat and abdominal adiposity.⁴ Obesity stands as one of the most common and also commonly neglected health issue all over the world⁵ Obesity is generally classified as generalized obesity (GO) and abdominal obesity (AO). Due to the increased risk of morbidity and mortality, obesity is now regarded as a disease. The good news is that obesity is preventable. But the bad news lies in facts given by WHO which state that the prevalence of obesity worldwide has become three times since 1975. More than 1.9 billion adults, came in the overweight category in 2016. Of these over 650 million were obese. In 2016, 39% of adults aged 18 years and over were overweight and 13% were obese. Most of the world's population live in countries where overweight and obesity kills more people than underweight⁶ Overweight and obese individuals are at an increased risk of hypertension, hypercholesterolemia, type 2 diabetes, coronary artery diseases, congestive heart failure, stroke,

gallstones, gout, osteoarthritis, obstructive sleep apnea and other respiratory problems, pregnancy complications, poor reproductive health and psychological disorders.⁷ People of Kerala now appear to be facing the problem of obesity mainly due to change in food habits which happened due to increased purchasing power, rapid westernization, dietary pattern change and decrease in physical activities. It is being found that from mid thirties to early fifties of age the population is slowly rising towards a BMI of 25. This in turn is leading onto more and more people developing lifestyle diseases like coronary artery disease, hypertension, diabetes at an early age.⁸ As the saying says that prevention is better than cure, studies which includes schools, colleges needs to be done to detect overweight, obesity at an earlier stage so that preventive and corrective measures can be taken before the ill effects of obesity take over. Hence this study was done to find the prevalence of generalised obesity and abdominal obesity among students in medical college. The information gathered is also intended to be used for individual and classroom health awareness steps regarding obesity.

MATERIALS AND METHODS

This study was conducted among medical students above the age of 20 years in PK Das Institute of Medical Sciences after obtaining clearance from the Institutional Ethics committee. The study was conducted from December 2016 to April 2017. The sample size was calculated to be 85 with an absolute precision of 10% and confidence level of 95% based on prevalence of obesity among adults aged 15-49 years in Kerala which was 30.45% according to NFHS.⁹ Further to this, 10% non response rate was added to arrive at the final sample size of 94. Using convenient sampling method, medical students above the age of 20 years were selected and students who were absent or unwilling were excluded from this study. Informed consent was taken from the participants. Study tools which were used included a weighing machine which was standardised using a known weight before the start of the study and measuring tape for measuring waist circumference and Hip circumference to the nearest millimetre. Height was measured using a fixed stadiometer wherein the participant was made to stand up straight against the wall with heels together and toes apart.¹⁰ Waist circumference was measured at the end of several consecutive natural breaths, at a level parallel to the floor, midpoint between the top of the iliac crest and the lower margin of the last palpable rib in the mid axillary line.¹¹ The hip circumference was measured at a level parallel to the floor, at the largest circumference of the buttocks.¹¹

Definitions: Overweight was defined as a BMI ≥ 23 kg/m² but < 25 kg/m² (based on the World Health Organization Asia Pacific Guidelines) with or without abdominal obesity (AO) for both genders. Generalized obesity (GO) was defined as a BMI ≥ 25 kg/m² (based on the World Health Organization Asia Pacific Guidelines) with or without abdominal obesity (AO) for both genders. Abdominal obesity (AO) was defined as a waist circumference (WC) ≥ 90 cm for men and ≥ 80 cm for women with or without GO.¹² Cut off for waist hip ratio was taken as more than or equal 0.85 for women, and more than or equal to 0.90 for men according to WHO.¹¹

RESULTS

In this study out of 85 participants, 21 (31.8%) were males and 58 (68.2 %) were females. Mean BMI among females was found to be 20.4kg/m² compared to males where it was found to be 22.5 kg/m². Mean Waist Circumference among females was found to be lower (72.5 cm) compared to males which was 77 cm. On the other hand mean waist hip ratio among females was found to be 0.79 whereas in males it was found to be 0.82.(Table 1) Table 2 shows that 7 (25.9%) males were obese compared to 8(13.8%) females. Although it was found to be higher in males compared to females with chi square value of 2.16 with p value of 0.53, the difference was not found to be significant. In case of waist circumference abnormal waist circumference was found to be higher in females (27.5%) compared to males (14.8%). But this difference was again found to be not significant (Table 3). Waist Hip ratio was found to be higher in females (17.2%) compared to males (14.8%) but the difference was not found to be significant (Table 4).

Table 1: Distribution of participants based on gender

Gender	Number	Percent
Males	27	31.8
Females	58	68.2

Table 2: Distribution of participants based on gender and BMI

BMI	Males		Females		Total	
	Number	%	Number	%	Number	%
Underweight	4	14.8	9	15.5	13	15.3
Normal	11	40.7	31	53.4	42	49.4
Overweight	5	18.5	10	17.2	15	17.6
Generalised Obesity	7	25.9	8	13.8	15	17.6

Chi square= 2.1619, p value= 0.539494,

Table 3: Distribution of participants based on gender and waist circumference

	Normal (Non-Obese)		Abnormal (Obese)	
	Count	Percentage	Count	Percentage
Female	42	72.5	16	27.5
Male	23	85.2	4	14.8
Total	65	76.5	20	23.5

Chi square 1.6071, p value 0.196244

Table 4: Distribution of participants based on Gender and Waist Hip Ratio

	Normal (Non-Obese)		Abnormal (Obese)	
	Count	Percentage	Count	Percentage
Female	48	82.8	10	17.2
Male	24	88.9	3	11.1
Total	65	84.8	13	15.2

Chi square= 0.5344, p value 0.464

DISCUSSION

Obesity is complex, multifactorial and as WHO pointed out, one of the most neglected diseases which along with overweight affects over a third of world's population. An extrapolation of secular trends estimates that by 2030, 38% of the world population will be overweight and 20% will be obese.¹³ Obesity is defined based on height per kg of body weight. But, simplicity of this definition ignores complex phenotype like that of Asians who have excess adiposity which manifests metabolically and not as higher weight. India is undergoing a change from dealing with under nutrition issues to over nutrition over the past few years. In phase I of the Indian Council of Medical Research - India Diabetes (ICMR-INDIAB) Study, prevalence of obesity was found to be 24.6, 16.6, 11.8 and 31.3 per cent in Tamil Nadu, Maharashtra, Jharkhand and Chandigarh, while the prevalence of abdominal obesity was 26.6, 18.7, 16.9 and 36.1 per cent in the above mentioned states respectively.¹⁴ A study in Chennai, The Chennai urban rural epidemiology study (CURES) reported age standardized prevalence of generalized obesity to be 45.9 per cent, while that of abdominal obesity was 46.6 per cent.¹⁵ Prevalence of obesity was found to be 44.7% among women and 33 % among men in a study conducted by Anil Bindhu *et al* in a rural area in Trivandrum.¹⁶ In a study conducted among urban school children in Cochin (Kerala), the prevalence of obesity was found to be 3.0% for boys and 5.3% for girls.¹⁷ The prevalence of obesity among adolescents of south Karnataka was found to be 5.2 % among boys and 4.3% among girls. In this study the prevalence of generalised obesity was found to be 25.9% among male medical students and 13.8% among female medical students and prevalence of abdominal obesity was found to be 14.8% and 27.5 % respectively. Our study considers an age after adolescence and shows a rise from childhood and adolescent obesity. The multifactorial nature of causation of obesity makes it important to address contributions from all angles like genetic, environmental. A very interesting survey in UK revealed that average energy intakes for all age groups have lowered compared to earlier times. It is suggested that physical inactivity is a more profound cause of obesity than increased calorie consumption.¹⁸ The school and college going students need to be made aware for prevention of or prolonging

the onset of overweight and obesity. A strong network including government organizations, non government organizations, schools, colleges families and individuals need to be thoroughly motivated to keep this problem at bay by taking steps at different levels. The stage where these risk factors can be prevented is also the stage which is very delicate and prone for stigmatisation. As is pointed out in the article by Signild Vallgård where ethical issues associated with early detection of overweight and obesity are discussed. The author says that early detection on one hand may prevent future comorbidities and it may help people lead a healthier life but on the other hand it may cause anxiety, interfere with integrity of people, may cause stigmatization and in some cases may even have adverse effects by inducing weight gain. He suggests that before early detection is introduced there more positive than negative effects need to be documented to prevent the dangerous effects mentioned before.¹⁹ Some suggestions given by Adela Hruby include attempting to limit national production and import of sugar sweetened beverages, putting tax on sugar sweetened beverages etc. Also preventing obesity could begin right from kindergarten level by incorporating health and wellness into the curricula. One more wonderful suggestion is to include pregnant women into the loop for nutrition education and intensive weight gain monitoring.²⁰ A holistic approach taking into account both positive as well as negative effects is what is required in dealing with this situation which is now gaining the importance of an epidemic, obesity epidemic.

REFERENCES

1. https://journals.lww.com/nutritiontodayonline/Fulltext/2015/05000/Body_Mass_Index__Obesity,_BMI,_and_Health_A.5.aspx
2. Song MY, Kim J, Horlick M, Wang J, Pierson Jr RN, Heo M et al. Prepubertal Asians have less limb skeletal muscle. *J Appl Physiol* 2002; 92: 2285–2291.
3. Chowdhury B, Lantz H, Sjostrom L. Computed tomography determined body composition in relation to cardiovascular risk factors in Indian and matched Swedish males. *Metabolism* 1996; 45: 634–644.
4. Misra A, Vikram NK. Insulin resistance syndrome (metabolic syndrome) and obesity in Asian Indians: evidence and implications. *Nutrition* 2004; 20: 482–491.
5. World Health Organization (WHO). Obesity: preventing and managing the global epidemic. Report of a WHO consultation. (1-253). World Health Organ Tech Rep Ser. 2000; 894:i–xii. [PubMed: 11234459]
6. <http://www.who.int/en/news-room/fact-sheets/detail/obesity-and-overweight>
7. Morrill, Allison C. and Chinn, Christopher D. (2004), "The obesity Epidemic in the United States", *Journal of Public Health Policy*, Vol.25, No.3, p. 355.
8. Vargheese, Ron T. and Vijayakumar, K. (2008), "Prevalence pattern of obesity across different age groups

- in a rural settings in Kerala”, Calicut Medical Journal, Vol.6, No.1, p.2.
9. http://rchiiips.org/NFHS/pdf/NFHS4/KL_FactSheet.pdf
 10. https://www.cdc.gov/nchs/data/nhanes/nhanes_07_08/manual_an.pdf
 11. Waist Circumference and Waist-Hip Ratio Report of a WHO Expert Consultation GENEVA, 8–11 DECEMBER 2008
 12. Rajendra Pradeepa et al, Prevalence of generalized and abdominal obesity in urban and rural India- the ICMR - INDIAB Study (Phase-I) [ICMR - INDIAB-3] Indian J Med Res. 2015 Aug; 142(2): 139–150.
 13. Kelly T, Yang W, Chen C-S, Reynolds K, He J. Global burden of obesity in 2005 and projections to 2030. *Int J Obes* 2005. Sep; 2008 32(9):1431–7
 14. Rajendra Pradeepa et al, Prevalence of generalized and abdominal obesity in urban and rural India- the ICMR - INDIAB Study (Phase-I) [ICMR - INDIAB-3], Indian J Med Res. 2015 Aug; 142(2): 139–150.
 15. Deepa M, Farooq S, Deepa R, Manjula D, Mohan V. Prevalence and significance of generalized and central body obesity in an urban Asian Indian population in Chennai, India (CURES: 47) *Eur J Clin Nutr.* 2009; 63:259–67.
 16. Anil Bindhu S, Thankam.K, Regi Jose, Benny PV, Nazeema Beevi, Jeeshha C.Haran,Prevalence of obesity and overweight among adults in a rural area in trivandrum - A cross sectional study, *IJPTM Vol 2 (2) / ARL-JUN*, 2014.
 17. Alice T Cherian, Sarah S Cherian and Sobhana Subbiah Prevalence of Obesity and Overweight in Urban School Children in Kerala, India,*Indian Pediatrics*, volume 49,june 16, 2012
 18. Willett W. *Nutritional Epidemiology*. 2nd edition. Volume 5. Oxford University Press; 1998. Food Frequency Methods; p. 74.
 19. Signild Vallgård, Ethics dilemmas of early detection of obesity, *Scandinavian Journal of Public Health*, 2016; 44: 543–545
 20. *The Epidemiology of Obesity: A Big Picture*, Adela Hruby, PhD, MPH and Frank B. Hu, MD, PhD, MPH, Department of Nutrition, Harvard School of Public Health, Boston, MA, USA (AH, FBH)

Source of Support: None Declared
Conflict of Interest: None Declared

