International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 06, 2020
ISSN: 1475-7192

Comparison of anthropometric indices of obesity to predict hypertension among young medical students

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***ABSTRACT**--Obesity is a risk factor for Hypertension[1]. Early detection of hypertsion is essential in young population and to detect best and trustable predictor for risk population and and also for planning prevention statergy[2]. In this study we are using anthropometric indices like Body mass index, neck circumference, waist to hip ratio values to predict hypertension among young medical students.are as follows To determine the accuracy of anthropometric indices of obesity to predict hypertension among young medical students.To determine the prevalence of hypertension and pre hypertension among young medical students.Methodology It is a cross sectional study. Setting: This study will be carried out in J. N. Medical College, Sawangi (Meghe), Wardha, which is a rural based medical college in state of Maharashtra. Study will be done among MBBS undergraduate in 1000 students of this college. It is planned to do this study from 1st August 2018 to 31st July 2020.Blood pressure and anthropometric indices and blood samples will be collected in medicine opd in five settings. We will enter the data in Microsoft excel sheet and will analyse that with STATA version 13 statistical software.Results There will be increase in mean values of all anthropometric indices in study population and increase in all anthropometric indices in female as compare to male significantly exception is WHR. Systolic BP and Diastolic BP is correlated with all anthropometric indices of obesity which shows BMI had topmost correlation coefficient and conicity index had low most correlation coefficient. Predictive potential is highest for hypertension, BMI, WC and WHtR In both male and female. Increase in anthropometric index with one standard deviation will lead to increase in hypertension prevalence ration.There will be strong association Systemic hypertension with BMI,WHtR . Anthropometric indices will have in male gender will have better predictive potential for prediction of hypertension.*

***Keywords**-- are Obesity, Hypertension and Anthropometric indices.*

I. INTRODUCTION

In number of countries there is threat to healthy individual's because of obesity.It is a global pandemic .Obesity is abnormal or excessive accumulation of body fat of 20% or more of persons's body weight[3-4]. Countries which are developed,in them because of littile physical activity and excessive consumption of food result in an imbalance between energy intake and energy utilization leading to obesity[3-4].Being a global pandemic obesity also has various phenotypes. The recognised phenotypes are metabolic healthy obesity(MHO), metabolic unhealthy

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Received: 22 Feb 2020 | Revised: 13 Mar 2020 | Accepted: 05 Apr 2020

obese, metabolic obesity normal weight(MONW) etc[5.] Studies also suggests that these phenotypes are associated with incident cardiovascular complications, metabolic syndrome, diabetes mellitus and also elevated levels of inflammatory biomarkes[6].

In the world obesity is increased three times from 1975[7]. In 2016, more than 1.9 billion adults and older, were overweight. Of these over 650 million were 39% overweight and 13% were obese[7]

In India, obesity is as an important health problem particularly in urban areas, replacing the more traditional public health concerns including under nutrition. Prevalence of obesity is seen in 30-65% of adult urban population[8]

Hypertension is a medical condition in which the blood pressure in the arteries is persistently elevated [9.] . Total prevalence in India for hypertension was found to be 29.8 percentage . There is appreciable diffenernce for hypertension were noted in noted between urban and rural areas [33.8 percentage and 27.6 percentage].[10]

Obesity is a risk factors for hypertension[11]. According to Framingham Heart Study, in population with overweight and obesity have hypertension in female and male in 28 percent and 26 percent.

We are using anthropometric parameters like body mass index(BMI) ,waist to hip ratio,waist circumference(WC).Measurement of Anthropometric indices will be done with using WHO criteria and with use of cut off values. [12]

Obesity will lead to gravemedical problems like hypertension , coronary artery disease , cardiac failure, dyslipidemia, increased prevalence of colon, prostate, endometrial, and breast cancer,oral cancer,oral submucuous fibrosis. [13-20]

II. BACKGROUND/RATIONALE

Obesity is a risk factor for Hypertension[1]. In this study we are using anthropometric indices like Body mass index, waist to hip ratio, waist circumference, neck circumference values to predict hypertension among young medical students.

III. OBJECTIVES

To determine the accuracy of anthropometric indices of obesity to predict hypertension in young medical students

To determine the prevalence of hypertension and pre hypertension in young medical students.

IV. METHODS

Study design: Study Setting, population and duration :. Study subjects will be chosen as per inclusion and exclusion criteria as described below.

Study design: This will be a cross section study.

Setting: This study will be carried out in Jawaharlal Nehru Medical College, Sawangi (Meghe), Wardha, which is a rural based medical college in state of Maharashtra. Study will be done among MBBS undergraduate students of this college. It is planned to do this study from 1st August 2018 to 31st July 2020.

Participants: It is expected around 1000 students will be enrolled at JNMC during this period and we aim at covering all the MBBS students enrolled during study period. MBBS students enrolled during study period. Study subjects will be chosen as per inclusion and exclusion criteria as described below.

Inclusion criteria :All MBBS students enrolled at JNMC during study period.

Exclusion criteria: Those who are not willing to give consent.

Variables: All study subjects will be explained the study procedure and nature of the evaluation to be done. Each student will be evaluated using study proforma in respect to relevant history and physical examination including blood pressure measurement (using standard method) anthropometric measurements including body mass index (BMI),waist to hip ratio (W/H),waist circumference (W/C) using standard method . Under aseptic conditions, fasting (over night fasting for 10-12 hours) blood sample will be drawn for biochemical analysis including Fasting blood sugar and fasting lipid profile

Definition of Obesity [3-4]

Obesity in this study was defined as per the body mass index (BMI) is abnormal or excessive accumulation of body fat of 20% or more of persons's body weight I) is We will use cutoff value of BMI and WC recommended for southeast asia population. The cutoff for defining obesity for WHR is > 0.9 for male and 0.85 for female.[3-4] Hypertension is defined as per JNC 7 BP $\geq$ 140/90 will be taken as hypertension and BP 120-139/80-89 will be taken as prehypertension.[21]

Indicator	Cuff-off points
Waist circumference	>80 centimeter in female,> 94 centimeterm in male
Hip circumference	>88 centimeter in female,>102 centimeter in male

Nutritional status	Cut off WHO criteria for BMI[12]	Cut off Asain criteria for BMI [22]
Underweight	<18.50	<18.50
Normal	18.50 to 24.99	18.50 to 22.99
Obese		23.0 to 24.99
Overweight	25.0 to 29.99	25 to 29.99
Obese type 1	>30.0 to 40.0	> 30.0
Obese type 2	40.10 to 50.0	40.10 to 50.0
Obese type 3	>50.0	>50.0

V. BIAS

sample would have been non response bias, volunteer bias .

Received: 22 Feb 2020 | Revised: 13 Mar 2020 | Accepted: 05 Apr 2020

Study size:. It is expected around 1000 students will be enrolled at JNMC during this period and we aim at covering all the MBBS students enrolled during study period. MBBS students enrolled during study period (31 August 2018 to 1 May 2020)

VI. STATISTICAL METHODS

We will enter the data in Microsoft excel sheet and will analyse that with STATA version 13 statistical software. We will calculate test characteristics like logistic regression,descriptive statistics,poissn regression and receiver operating characteristic curve analysis for all the anthropometric indices for predicting Hypertension in study subjects.

VII. EXPECTED OUTCOMES/RESULTS

According to study carried out in Nigeria 912 population was taken part with informed consent. In this study population prevalence of pre hypertension and hypertension were 42.5 percent and 22.8 percent respectively. The study of anthropometric indices of obesity in Nigeria shows that increased mean values of all anthropometric indices in study population and increase in all anthropometric indices in female as compare to male significantly exception is WHR. In this study Systolic BP and Diastolic BP is correlated with all anthropometric indices of obesity which shows BMI had topmost correlation coefficient and conicity index had low most correlation coefficient.Predictive potential is highest for hypertension,BMI,WC and WHtR In both male and female.Increase in anthropometric index with one standard deviation will lead to increase in hypertension prevalence ration.In male and female with increase in BMI there will be increase in hypertension prevelance ratio.

VIII. DISCUSSION

Key results: In hypertensive patients mean values of anthropometric indices are higher than pre hypertensive and normotensives. Previous study on East Azerbaijan people concludes that prevalence of pre hypertension and hypertensions were 16.3% and 23.3% done by Azar[23].It is found in past study in Indian population in patient with prevalence of 40.8 % with BMI of greater 27.6 kg/m^2) 47.2 % of WC greater than 98.1 cm, 44.7 % of WHR greater than 0.98) [24] .In Asians strong predictor for Hypertension are bmi and waist to height ratios according to study of DECODA[25].Negative part of using waist circumference is inability to contrasting between subcutaneous and visceral fat deposition.[26] Various article related to different factors involved in this study were accessed and reviewed [27-80].

Limitations: Error in measuring anthropometric indices, non responsive bias, Negative part of using waist circumference is inability to contrasting between subcutaneous and visceral fat deposition.

Interpretation: In different students with different lifestyle, culture, environmental and genetic differences which differs in results of anthropometric indices for predicting hypertension. .

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