# Determination of relationship between anthropometrical markers and lipid profile in respiratory patients

Shahedi Valiollah

Islamic Azad University, Parand Branch

shahedi2006@yahoo.com

**Abstract.** **Background and Aim**: Epidemiological data indicate a relationship between obesity and respiratory diseases. The purpose of this study is to determine anthropometrical markers in relation to lipid profile in adult males with respiratory disorder. **Material and methods**: In this study participated 30 respiratory patients' adult males aged 35 to 50 years with 90 to 98 kg of weight by randomly. Blood samples obtained of each patient after 10 – 12 hours overweight fasting with regard to lipid profile (total cholesterol, triglyceride, low density cholesterol, high density cholesterol) and Body mass index and other anthropometrical indexes monitored. Multivariate regression models performed for determine association between variables. **Results**: The statistical data of Multivariate linear regression analysis showed a liner relationship between each of lipid profile with WC, WHR and BMI in these patients but these relations were not significantly. There is only a high positively significantly correlation between total cholesterol with WC. **Conclusion**: Our study findings didn't support of significant relation between anthropometrical and lipid indexes in these patients. In the other hand, the anthropometrical indexes aren't suitable predictor for lipid profile concentration in these patients.

**Keywords**: Respiratory disease, obesity, lipid profile, anthropometrical indexes

## 1. Introduction

The prevalence of Overweight and obesity increased dramatically in industrialized and developing countries and are related to cardiovascular risk factors such as 2 diabete, hypertension, and syndrome metabolic and respiratory diseases such as asthma. Epidemiologic data indicate that the incidence of asthma is increased in obese patients (1). But the mechanisms are unclear. Body mass index (BMI), which relates weight to height, is the most widely used and simple measure of body size, and is frequently used to estimate the prevalence of obesity within a population. Thus, other anthropometric indices such as waist circumference (WC), waist-to-height ratio (W/Ht), and waist-to-hip ratio (WHR) have been used as alternatives to BMI. Waist circumference is increasingly being accepted as the best anthropometric indicator of abdominal adiposity and metabolic risk. Most of these studies show that the incidence of asthma and increased BMI are frequently related. In general, the more BMI increases, the more the incidence of asthma rises, and this effect is generally stronger among women than among men. However, this difference is always very small and seems to be related to the degree of adiposity in women (2). Both lipid profile and body fat have been shown to be the important predictors for metabolic disturbances including dyslipidaemia, hypertension, diabetes, cardiovascular diseases, hyperinsulinaemia etc. It is unknown whether BMI or WHR can predict a lipid profile. While increases in body mass index (BMI) have been associated with the incidence and prevalence of asthma, the mechanisms behind this association are unclear. Although several studies have analyzed the association between serum lipids with anthropometric markers, few, including the present one, support WC as a good predictor of lipid profile. After adjustment for age, percentage of body fat, smoking, alcohol intake, and physical activity, waist circumference was not significantly related to the ratio of total cholesterol high-density lipoprotein cholesterol, whereas the waist-to-hip ratio was strongly

associated among the youngest subjects ($\beta$ = 3.51, $P$ = 0.005). In this study, we investigate relationship between anthropometrical markers and lipid profile in asthma patients.

## 2. Methods.

The objective of the present study was to determine the relationship between anthropometrical markers (WHR, WC, BMI) and lipid profile (total cholesterol, triglyceride, low density cholesterol, high density cholesterol) in these patients. For this purpose, a total of 30 obesity or overweight asthma patients with mild to average intensity participated in this study. All subjects underwent anthropometric assessment and laboratory investigations. Basal blood samples were collected after a 10 – 12 hours fast to determine metabolic variables. The anthropometric measurements taken were height (cm), weight (kg), waist circumference (cm) and hip circumference (cm). Multivariate regression models performed for determine association between variables.

## 3. Results.

The relationship between anthropometric and metabolic characteristics of the study participants are shown in Table 1. Multivariate linear regression analysis showed a liner relationship between each of lipid profile with WC, WHR and BMI in these patients but these relations were not significantly. There is only a high positively significantly correlation between total cholesterol with WC (figure 1).

### Table 1: Correlation between anthropometrical markers (BMI, WHR, WC) and lipid profile (TG, TC, LDL, HDL) in asthma patients

| Variables | BMI | WHR | WC |
|---|---|---|---|
| TG (mg/ dL) | 0.151 | 0.720 | 0.058 |
| TC (mg/ dL) | 0.058 | 0.252 | 0.007 |
| LDL (mg/ dL) | 0.282 | 0.076 | 0.213 |
| LDL (mg/ dL) | 0.273 | 0.669 | 0.049 |

## 4. Discussion / Conclusion

Obesity increases the prevalence, incidence, and possibly severity of asthma, while weight loss in the obese improves asthma outcomes. Visceral adipose tissue is the body fat depot most strongly related to the metabolic abnormalities of obesity. Cross-sectional and prospective cohort studies of humans have shown a modest overall increase in asthma incidence and prevalence in the obese, although body mass index does not appear be a significant modifier of asthma severity (3). Asthma cases slowed low levels of serum cholesterol, triglyceride, LDL and VLDL compared to the control group, while HDL-C were higher than the healthy control group. Janssen et al (2002) opined that body mass index and waist circumference independently contributed to the prediction of abdominal, subcutaneous and visceral fat(4). Hardev et al indicated that Waist to hip circumference ratio was positively correlated with serum cholesterol, triglyceride and LDL-C in patients with diabetes mellitus (5). Our study demonstrated that among the anthropometric indices, just waist circumference had a correlation significantly with TC level. None of the indices showed any relation to levels other variables. Our data showed that WC is partly good predictors of abnormalities in lipid profile. Also, TC level showed the closest relationship with other lipid profile markers than other anthropometric indices. These findings are consistent with the finding by Chehrei et al in Iranian adults.

# 5. References

[1] S. A. Shore, I. N. Schwartzman, M. S. Mellema, L. Flynt, A. Imrich, R. A. Johnston, Effect of leptin on allergic airway responses in mice. J Allergy Clin Immunol. 2005 Jan; 115(1):103-9.

[2] M. G. Lemos-Santos, J. G. Valente, R. M. Goncalves-Silva, R. Sichieri, Waist circumference and waist-to-hip ratio as predictors of serum concentration of lipids in Brazilian men. Nutrition 2004; 20: 857-62.

[3] M. G. F. Lemos-Santos, R. Sichieri, Waist circumference and waist-to-hip ratio as predictors of serum concentration of lipids in Brazilian men. 2004; 20 (10), 857-862.

[4] K. G. Tantisira, A. A. Litonjua, S. T. Weiss, A. L. Fuhlbrigge. Association of body mass with pulmonary function in the Childhood Asthma Management Program (CAMP). Thorax. 2003; 58(12):1036-41.

[5] I. Janssen, S. B. Heymsfield, D. B. Allison, D. P. Kotler, R. Ross, Body mass index and weist circumference independently contribute to the prediction of non abdominal, abdominal subcutaneous and visceral fat. Am. J Clin. Nutr.2002; 75: 683-688.