Chapter one

Introduction ,Rationale
Objectives

1.Introduction, Rationale and objectives

1.1 Introduction

Obesity refers to excess of body fat which is due to greater energy intake compared to the energy expenditure. And has been associated with an increased risk for metabolic syndrome in adults (Lerario *et al*., 2002).it associated with a low-grade inflammation of white adipose tissue (WAT) resulting from chronic activation of pro inflammatory molecules: C-reactive Protein (CRP), tumor necrosis factor-a (TNF) and interleukin-6 (IL-6) (khan *et al*., 2011) and also was strongly associated with elevated levels of C-reactive Protein in all populations observed (Nakamura *et al*., 2008) and this association was stronger in women than men (Choi, 2013) .

The acute-phase reaction could play an important role in the path physiology of the metabolic syndrome and type 2 diabetes (Pickup *et al*., 2000). Several lines of e evidence suggest that elevation of C-reactive Protein may reflect not only local inflammation at atherosclerotic lesions but also systemic abnormalities related to insulin resistance, such as increase in fasting insulin, body mass index systolic blood pressure as well as decrease in high lipoprotein cholesterol (HDL-C)(Hanyu *et al*., 2007; Ridker *et al*,. 2003). increased concentration of total cholesterol and low density lipoprotein (Dilip *et al*., 2012) And increase in Triglyceride (Abhagupta *et al*., 2015).

The magnesium is an essential ion for many enzymatic reactions, especially those using high energy phosphate bounds. The low serum magnesium levels are associated with coronary heart disease, atherosclerosis, dyslipidemia. And high blood pressure .These findings suggest that hypomagnesaemia could be involved in the pathogenesis of cardiovascular disease ,insulin resistance ,and type 2 diabetes (Ridker *et al*.,2003).

  Magnesium deficient rats showed a significant increase in the acute-phase reactants, and concluded that inflammatory response is an early consequence of magnesium deficiency, suggesting that reduced extracellular magnesium might be responsible for the activated state of immune cells. The sequence of early events that produces the acute-phase response is currently unknown (Malpuech *et al*., 2000) .

1.2 Rationale

The obesity is a world problem disease which increases in both sex's males and females and occurs in different age groups more over it's a major risk factor for stroke, peripheral vascular disease, heart failure and chronic kidney diseases also it associated with Inflammatory processes that have important roles in the etiology of coronary heart disease (CHD).

Several studies have shown that elevated plasma levels C-reactive protein (CRP), hypo magnesium and decrease in high density lipoprotein associated with the risk of Cardiovascular disease and the severity of atherosclerosis.

In the Sudan little is known about the association between C-reactive protein and serum magnesium and lipid profile (total cholesterol ,low density lipoprotein cholesterol, high density lipoprotein cholesterol and triglyceride) in obese and overweight subject, there fore this study hypothized that the CRP was increase, lipid profile were increase except HDL cholesterol and magnesium was decreased in obese and overweight subject.

1.3 Objectives

1.3.1 General objective

The aim of this study was to evaluate the level C-reactive protein, lipid profiles and serum magnesium level among obese and overweight subjects in Khartoum state .

1.3.2 Specific objectives

1-To measure and compare means of C-reactive protein, lipid profile and serum magnesium level of obese and overweight versus normal weight subject.

2-To calculate the body mass index and waist hips ratio in obese and overweight versus normal weight subject.

3-To correlate between C-reacive protein ,lipid profile, serum magnesium , and variables of study(BMI ,WHR).