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EFFECT OF THE OBESITY ON INTERLEUKIN-6 AND REACTIVE OXYGEN SPECIES

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ABSTRACT : Obesity is defined as abnormal or excessive fat accumulations that may impair health include fertility. The most common way to evaluate fat accumulation is through the Body mass index (BMI), which is calculated using person's weight in kilograms divided by the square of his height in meters (kg/m^2). The study was carried out on 80 men (60 are patients with BMI >30 and 20 as a control with BMI < 30) with age range (20-60) years. There is a significant (P<0.0001) increase in level of Body mass index (BMI) (34.78 ± 4.1 kg/m^2) in patient group comparison to control group (27.9 ± 2.4 kg/m^2). The level of interleukin-6 (IL-6) is increase in patients (P < 0.01, 4.31 ± 2.8ng/ml) comparing to control (1.95 ± 0.96ng/ml). The mean level of Reactive oxygen species (ROS) significant (P< 0.01) increase (633.16 ± 568.9) comparing to control (254.78 ± 108.74).

Key words : ROS, BMI, IL-6, obesity.

INTRODUCTION

Obesity is defined as abnormal or excessive fat accumulation that may impair of homeostatic control of food intake which result in increased energy intake in relation to the metabolic demands of the body and consequently increased energy intake in relation to energy expenditure and therefore weight gain (Swinburn *et al*, 2011). However, obese individual differ not only according to the degree of excess fat which they store, but also in the regional distribution of that fat within the body (WHO, 1997). Obesity has become the pandemic of the 21st century. It's rapidly growing prevalence together with associated comprises one of the gravest healthcare problems of our time (Kelly *et al*, 2013).

Body Mass Index of 25 or greater increased from 28.8% in 1980 to 36.9% in 2013 for men and from 29.8% to 38% for women, in developed countries, men have higher rate of overweight and obesity. On the other hand, women in developing countries display higher rates of overweight and obesity and this relationship is stable over time (Ng *et al*, 2014). Medical risk progressively as the degree of obesity increases starting with over weight (BMI between 25.0 and 29.9 Kg/m^2), through Class I obesity (BMI between 30.0 to 34.9 Kg/m^2), Class II obesity (BMI between 35.0 to 39.9 Kg/m^2) and Class III or extreme obesity (BMI ≥ 40 Kg/m^2) (WHO, 2014) (Table 1).

Obesity cause a chronic inflammatory state, Adipose tissue is one of the main sources of inflammatory mediators, with interleukin-6 (IL-6) among them (Palmer *et al*, 2012). Adipose tissue can be divided into two major types: white adipose tissue (WAT) and brown adipose tissue. WAT represents the vast majority of adipose tissue in humans and is the site of energy storage ,WAT produces a number of adipokines linked to inflammation, including adiponectin, IL-1b, IL-6, TNF-α, MCP-1 and MIF. Circulating levels of TNF-α and IL-6 are directly correlated with adiposity and insulin resistance (Shoelson *et al*, 2006).

Palmer *et al* (2012), obesity cause a chronic inflammatory state causing formation of reactive oxygen species (ROS), which can induce damage to sperm DNA and membrane as well as increase stress on testicular environment. DuPlessis *et al* (2010) obesity during childhood increases the insult time creating more profound damage on DNA fragmentation; that affect fertilization and embryonic development (Chavarro *et al*, 2010).

MATERIALS AND METHODS

The current study was carried out on 80 men (60 are patients with BMI >30 and 20 as a control with BMI < 30) with age range (20-60) years, attended to Kamal Al-Sameray Hospital during the period extended between December, 2018 to May, 2019.