

## ORIGINAL ARTICLE

# Obesity and its hormonal profile in the Saudi male population as represented by the Makkah community

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## ABSTRACT

### Aim of the study

Obesity is a complex multifactorial chronic disease that develops from an interaction of genotype and environment. It involves the integration of social, behavioural, cultural, physiological, metabolic and genetic factors. The increasing prevalence of overweight and obesity is an important public health problem contributing to significant excess in morbidity and mortality. This study aims to examine obesity in the Saudi male population as represented in this particular case by the Makkah community.

### Material-Methods

Leptin concentration in addition to other measurements such as body mass index (BMI) and waist circumference (WC) were taken. Two-hundred and fifty five males (n=255) between the ages 18 and 72 participated in this study. Volunteers were divided into three groups. The first group was the normal or control group with a (BMI) range from 18 to 29.9, the second group were obese and characterised by a (BMI)  $\geq 30$  and the third and final group consisted of obese individuals with a body mass index of (BMI)  $\geq 30$  who also suffer from diabetes mellitus. Data collected included height, weight and waist circumference and a blood sample was also taken. Blood samples were later thawed and serum leptin levels were detected with ELISA.

### Results

Leptin was measured in all 3 groups and the mean values were found to be (6.81 $\pm$ 4.48) in the normal group, (31.89 $\pm$ 20.36) in the obese group and (21.23 $\pm$ 13.75) in the diabetic obese group. Leptin levels were directly associated with BMI (r=0.553, p=0.000) in the normal group, and a strong positive correlation in the obese group and diabetic obese group were as follows: (r=0.687, p=0.000), (r=0.276, p=0.011). In addition, leptin concentrations were positively correlated with WC in both the obese and the diabetic obese.

### Conclusions

Leptin concentrations were found to be high in both the

obese and diabetic obese group and showed a direct and positive relationship to BMI and waist circumference. It is understood that the leptin hormone influences both appetite and body weight that can lead to obesity. However, serum leptin concentration can change in response to many variables such as fasting, hypertension, physical activity, smoking or adherence to a special diet.

**Keywords:** obesity, male, hormones, leptin, diabetes, Saudi Arabia.

## INTRODUCTION

Obesity is a condition of an abnormal or excessive accumulation of body fat in adipose tissue to the extent that health may be impaired.<sup>1</sup> It is a complex multifactorial disease that develops from the interaction between genotype and the environment. However, it involves the integration of social, behavioural, cultural, physiological, metabolic, and genetic factors.<sup>2</sup> It is well established that obesity is associated both directly and indirectly with various diseases, especially cardiovascular disease, hypertension, diabetes mellitus, sleep apnea, osteoarthritis, fatty liver disease, gallbladder disease, and certain types of cancer.<sup>2</sup> Therefore, its manifestation poses a real threat to health.<sup>3</sup>

Obesity can be regarded as a major health problem among the Saudi population. A previous study indicated that within the overall population aged 14-70 years, 13.05% of males and 20.26% of females were obese. This value is higher than that reported within the populations of the United Kingdom, Australia, America and Italy.<sup>4</sup>

### Physiology of obesity and weight loss therapies

The hypothalamus plays a central role in the regulation of appetite, where the feeding center, located in the lateral hypothalamic nucleus, and the satiety center, located in the ventromedial nucleus, interact. The brain regulates energy homeostasis in response to signals from both adipose tissue and the gastrointestinal tract. The drive to eat and energy expenditure are adjusted so that over time, body weight remains stable.<sup>6</sup> Understanding the physiology of obesity, including the role of appetite as it relates to energy intake and weight gain, is essential for developing efficacious weight-loss therapies. There are also several compounds that appear to participate in the regulation of food intake, including

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