CHAPTER-1

Introduction

1.0 INTRODUCTION

1.1 Obesity Epidemic and Yoga

Obesity is a health disorder and it is increasing globally. World over about 266 million men (95% CI 240–295 million) and 375 million women (CI 344–407 million) are obese in 2014 , whereas in 1975 only 34 million men (CI 26–44 million) and 71 million women (CI 57–87 million) were obese (NCD Risk Factor Collaboration, 2016). Further it is noted that obesity is spreading in more urban areas (Prasad, Dash, Kabir, & Das, 2012; WHO Obesity and overweight, 2016). Childhood obesity is affecting all socio economic sectors both in developed and developing countries (Raj & Kumar, 2010). The obesity is increasing in urban areas in India and the reasons for increase in obesity are multi-factorial (Girdhar, Sharma, Chaudhary, Bansal, & Satija, 2016; Monteiro & Azevedo, 2010). Further in the national health survey it was stated that in the urban area of Maharashtra 32.4 percentage women and 31.2 percentage men are overweight (Indian Institute for Population sciences, 2015).

In general, overweight and obesity are considered to be the outcome of unbalance in calorie intake and energy expended. Studies show that increased intake of different forms of sugar combined with physical inactivity causes increase in obesity worldwide (Dehghan, Akhtar-Danesh, & Merchant, 2005). Also lifestyle changes, cultural social and environmental factors are linked to eating disorders and physical inactivity. Studies suggest that chemical exposures also add to the risk of obesity by making changes in adipocytes and neural circuits that control the eating behavior (Thayer, Heindel, Bucher, & Gallo, 2012). The global trends in life style, food consumption traits, social network, sleep pattern etc., also leads to increase in obesity (Bornstein, Ehrhart-Bornstein, Wong, & Licinio, 2008; Christakis & Fowler, 2007).

Yoga is an ancient Indian philosophy and a holistic therapy which promotes mental peace. The psychological factors causing obesity can be addressed by yoga practice (Koch, Sepa, & Ludvigsson, 2008; Udupa, 2000).

1.2 Definition and Clinical Features

Obesity is a chronic disorder of extra body fat deposition leading to many diseases. It is generally measured by BMI (Body Mass Index) and is calculated as weight divided by square of height, wherein weight is in kilograms and height is in meter.

As per WHO, BMI ≥ 25 is overweight and ≥ 30 is considered obesity. However for Asian population, the BMI cut off points considered are lesser (Mini Sheth, 2011; Snehalatha, Viswanathan, & Ramachandran, 2003). In the present study BMI ≥ 25 is considered as obese.

Obesity has following clinical features,

a. A body weight of 20 percentage or more than the normal weight according to age, gender and height.
b. Waist circumference >40 in. (101.6 cm) for male and 35 in. 88.9cm for female.
c. Waist hip ratio >0.9 for male and >0.85 for female.
d. The mid arm circumference is also a standardized assessment (Bishop & Pitchey, 1987; Cattermole, Leung, Mak, Graham, & Rainer, 2010; Dairo, Fatokun, & Kuti, 2012)

1.3 Burden of Obesity

Obesity is adversely affecting both developed and developing countries. The obesity prevalence will be 600 million people by the year 2025 globally, if preventive action is not taken. Further obesity is cause for many diseases such as Type 2 diabetes, dyslipemia, hyper uricemia, arterial hyper tension, cardio vascular diseases, respiratory diseases, obstructive sleep apnoea syndrome, musculo skeletal disorders (Bergström et al., 2001; Després & Lemieux, 2006; Formiguera &

Cantón, 2004). Thus obesity is a platform for a number of non-communicable diseases (Deepa, Farooq, Deepa, Manjula, & Mohan, 2009; Koch et al., 2008). Further obesity also causes social withdrawal, low self-esteem, depression etc., (Stunkard, Faith, & Allison, 2003).

The death due to non-communicable diseases, all over the world, is projected to 69 percentage by 2030 (Mathers & Loncar, 2006). Further a very recent study shows that the obesity causes eight more types of cancers (Lauby-Secretan et al., 2016).

The average medical expenditure for overweight and obese compared to the normal weight people is higher considering the medical claim in diabetes asthma or other conditions (Walls, Backholer, Proietto, & McNeil, 2012). Further several factors will be masking the effect of obesity on longevity. Obesity leads to morbidity and mortality and causes huge expenditure (Van Baal et al., 2008). Thus life time expenditure has increased due to obesity for the individual and to country (Sansbury & Hill, 2014).

1.4 Global Prevalence

Obesity and overweight are major risk factors for death worldwide (Sansbury & Hill, 2014). About 3.5 million adults die due to obesity. Further 44% of diabetic, 23 percentage of ischemic heart disease and between 7 to 41 percentage of certain cancer are because of obesity (Conterno, Fava, Viola, & Tuohy, 2011). It is noted that the developed countries face significant increase in obesity since 1980 (Conterno et al., 2011). Obesity is second leading preventable cause of illness and death in US, next to tobacco use (Brawer, Brisbon, & Plumb, 2009). Obesity causes high disease burden in Canada (Luo et al., 2007) and Australia (Veerman, Barendregt, Forster, & Vos, 2011). Further, increase in prevalence of obesity can be found in many countries (Kalra & Unnikrishnan, 2012; Ramachandran & Snehalatha, 2010).

1.4.1 Asian and Indian Prevalence

Over weight and obesity is very much prevalent in many Asian countries. In these countries, people have diseases caused by obesity such as diabetes, hypertension and cardio vascular diseases in younger ages compared to western countries. There are modifications in life style due to socio economic changes. The life style changes leads to lesser physical activity (Ramachandran & Snehalatha, 2010). Asians develop non communicable diseases like diabetes with a lower degree of obesity compared to developed countries.

Traditionally the problem of obesity was not considered with much importance in India due to concern of under nutrition (Dhurandhar, 2014). The fast urbanization and changes in life style increased the obesity problem to alarming proportions in India (Yadav & Krishnan, 2008).

Further obesity is a major cause for sudden increase of diabetes mellitus in India (Kalra & Unnikrishnan, 2012). Studies show that central obesity and sedentary life style exist along with under nutrition and this is a public health problem in many of the Indian cities like Kolkatta, Trivandrum and Mumbai (Singh et al., 2007).

Also studies show that Asian Indians have some special features of obesity such as increased body fat, abdominal fat, increased subcutaneous and intra-abdominal fat etc. (Dhurandhar, 2014). In Asia, people are more vulnerable to many metabolic disorders, such as insulin resistance or diabetes, at lower BMI (Dhurandhar, 2014). This is due to the preferential fat deposition in visceral depot (compared to subcutaneous depots) and thus the cutoff values of BMI were reduced. Hence better understanding of the phenomenon is needed for prevention and management of obesity.

1.5 Pathophysiology

Pathophysiology of obesity is linked to food intake exercise genetic factors, environmental factors etc. (Gurevich-panigrahi, Panigrahi, Wiechec, & Los, 2009). Increased physical inactivity due to

the sedentary life style of work, easy modes of transportations etc., and increasing urbanization causes more unbalance in the food intake and energy expenditure. Thus due to the major non communicable diseases, life span is reduced by more than seventeen years in men (Kitahara et al., 2014).

1.6 Psycho Neuro Physiology

Psycho Neuro Physiology shows relationship between mind and the nervous system. Mind and nervous system are linked to the cause of obesity. The hypothalamus which is the seat of emotions, regulate hunger and satiety. During emotional surges, the entire system is disturbed and results in over eating and binge eating without hunger. Thus the mental stress leads to eating disorders. Due to continuous stress the cortisol level will be in increased stage all the time and this increased state leads to diseases such as abdominal obesity, diabetes, osteoporosis and cardiovascular disease (Manenschijn, Koper, Lamberts, & Van Rossum, 2011).

The brain/ nervous system or mind is also affecting the sleep and eating habits leading to obesity. Hence the yoga practices, which directly affect the mind, can be one of the solutions for the control and prevention of obesity.