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OBESITY : A STUDY

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INTRODUCTION

Obesity represents a state of excess storage of body fat. Although very similar, the term-overweight is defined as an excess body weight for height. The term obesity is derived from the Latin word 'obese', which means 'fattened by eating'. Obesity is complex, wherein the net energy intake exceeds the net energy expenditure over a prolonged period of time which tips the energy balance in favour of weight gain. It is a complex multifactor chronic disease that develops from an interaction of genotype and the environment.

Obesity is a cosmopolitan disease that affects all races worldwide. However, certain ethnic and racial groups appear to be particularly predisposed. Secular trend studies clearly underline the marked importance of environmental factors (particularly dietary issues) in the development of obesity. Though adult men have a body fat percentage of 15-20%, women have a higher proportion (approximately 25-30%); no significant sex difference exists in the prevalence of obesity.[1]

REVIEW OF LITERATURE

Definition: obesity represents a state of excess storage of body fat. Although very similar, the term over weight is defined as an excess body weight for height. The term obesity is derived from the Latin word 'obese', which means 'fattened by eating'.

AETIOLOGY OF OBESITY

The etiology of obesity is multifactorial. Genetic, environmental, psychosocial and other factors all may play a role in obesity, which occurs when a person's calorie intake exceeds the amount of energy he she burns. Among the facets to be considered in the development of obesity some are as following:

1. Metabolic Abnormalities.

Regardless of the cause or type of obesity, the metabolic consequences are predictable. They appear to be related directly to fat cell size and virtually all metabolic disturbances that have been observed are inducible with weight gain and reducible with weight reduction. The metabolic alteration with the most profound influence is the acquired resistance to the action of the insulin on glucose utilization by fat and muscle cells. Insulin resistance associated with adiposity has been demonstrated both in vivo and in isolated fat cell systems.

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2. Behavioral changes

The behavioral changes conductive to weight gain are as follows:

High-fat diets do not switch off appetite as carbohydrates and proteins. Also fat induces very little energy expenditure when consumed, as most is stored. Studies have shown that the prevalence of obesity is greatest in those eating high fat intake.

Snacking and the loss of formalized meal patters reduce the conscious recognition of foods eaten.

Consumption of energy-dense foods (and drinks), often high in fat and sugar but low in bulk, increase energy intake substantially.

Alcohol promotes weight gain as it provides substantial energy, and can stimulate appetite and loosen restraint.

Declining overall levels physical activities in society occur with sedentary jobs, a change in social circumstance and sedentary pastimes; e.g. the television watching 'couch potato'.

Giving up smoking induces a fall in energy expenditure equivalent to 9K cal per cigarette and an increase in food intake. Nevertheless, the risk of smoking is so substantial that a rise in weight of 11kg would be required to neglect the benefit of giving up smoking 20 cigarettes per day.

3. Genetic factors

Obesity tends to run in families, but since family members share diet and lifestyle habits as well as genes, identifying genetics as the sole cause may be difficult. Many people genetically predisposed to obesity do not become obese or manage to lose the weight and keep it off.

Scientists have shown that changing a single gene can produce a obese rat. Some of us will have genes that make a healthy weight easy while the rest of us will not. Remember, genetics is a cause of obesity that can be overcome.

Genetic syndromes (eg, Prader-Willi syndrome, Alstrom syndrome, Bardet-Biedl syndrome, Cohen syndrome, Borjeson-Forssman-Lehmann syndrome, Froehlich syndrome) can also lead to obesity.

4. Age

As we get, our metabolism slows and we become more sedentary. Less activity, less muscle mass (muscle metabolizes faster than fat) and the same diet hence overweight. The bottom line is that there is same (or more) calories intake but burning fewer calories. But obesity can occur at any age, and generally increases with age.

5. Endocrine factors

These may be involved in occasional cases, e.g., Cushing syndrome, growth hormones deficiency etc.

Examples of endocrinal abnormality leading to obesity:-

Cushing's syndrome – Obesity is one of the cardinal features of Cushing's syndrome, and it is clinically important to consider Cushing's syndrome and pseudo-Cushing's syndrome in differential diagnosis of obesity. If Cushing's syndrome cannot be excluded, an endocrine consultation is appropriate.

Hypothyroidism – Women with hypothyroidism often gain weight because of a generalized slowing of their metabolic rate. Some of this gain is due to fat.

6. Drugs

Certain drugs may contribute to weight gain; these include corticosteroids, tricycles antidepressants, evaporate, sulphonylureas for diabetes and some steroidal contraceptive.

TYPES OF OBESITY

Before dividing the obesity in various types it is important to know the location of excess fat in various body parts –

Type	Location of excess fat
I	Total body (most common)
II	Subcutaneous fat on trunk (Android)
III	Subcutaneous fat in lower body (Gynoid)
IV	Visceral fat in abdomen (intra abdominal fat)

Based upon the distribution, number and size of fat cells obesity can be described as of following types:

1. Android obesity – In android obesity there is abdominal fat distribution leading to apple shape appearance (Fig 1). This type is most common in males. To check the abdominal obesity one measures the waist-hip ratio. This is the waist circumference in centimeters divided by hip circumference in centimeters. The waist circumference is usually measured halfway between the superior iliac crest and the rib cage in the midaxillary line, whereas the hip circumference is measured one-third of distance the between the superior iliac crest and the patella. Circumference of 102 cm in men and 88 cm in women indicate a markedly increased potential risk requiring urgent therapeutic intervention.

2. Gynoid obesity – In this there is distribution of fat mainly around the hip and thighs, which gives them a pear shape appearance (Fig 2). This type is most common in females.

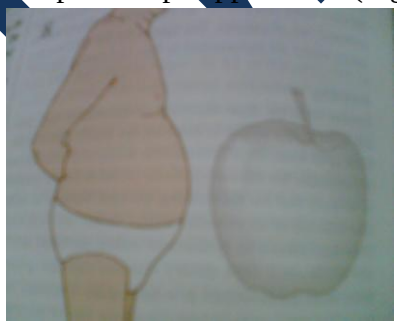

Fig1 Apple shape

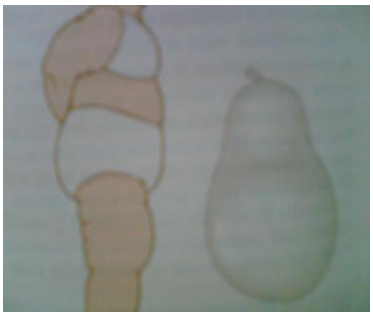

Fig2 Pear shape

3. Hyper plastic obesity – Increase in the total number of fat cell leads to Hyperplastic obesity. It is a kind of obesity with lifelong history. Accumulated fat is distributed peripherally and centrally. To some extent there is increase in number of fat cells also. Long-term response to treatment is poor.

4. Hypertrophic obesity – It is a type of obesity in which there is increase in adipose cell size only. It has a history of adult onset with central fat distribution. Long-term response to treatment is fair.

COMPLICATIONS OF OBESITY

Some of the serious health problems linked to obesity:

- **Osteoarthritis** (wearing away of the joints). Osteoarthritis is common joint disorders that most often affects the joints in your knees, hips, and lower back. Extra weight puts extra pressure on these joints and wears away the cartilage (tissue that cushions the joints) that normally protects them. Weight loss may improve the symptoms of osteoarthritis.
- **Gout** (joint pain caused by excess uric acid). Gout is a joint disease caused by high levels of uric acid in the blood. Uric acid sometimes forms crystals that are deposited in the joints. Gout is more common in overweight people. If you have a history of gout, check with your doctor before trying to lose weight. Some diets may lead to an attack of gout in people who have high levels of uric acid or who have had gout before.
- **Heart disease**. Heart disease is the leading cause of the death for both men and women in the United States. Heart attack, heart failure, and angina (chest pain caused by reduced blood flow to the heart).
- **Stroke.** A stroke is sometimes called a "brain attack". Most strokes are caused by a blood clot blocking an artery that takes blood to the brain.
- **Diabetes**. Overweight people are twice as likely to develop type 2 diabetes as people who are not overweight. Type 2 diabetes reduces your body's ability to control your blood sugar. It is a major cause of early death, heart disease, kidney disease, stroke, and blindness. If you have type 2 diabetes, losing weight and being more physically active can help you to control your blood sugar levels. You may also be able to reduce the amount of medicine that you need.
- **Cancer.** of the gallbladder disease, breast, uterus, cervix, and ovaries (for women). Overweight men are at greater risk for developing cancer of the colon, rectum, and prostate.
- **Gallstones or gallbladder disease.** Gallbladder disease and gallstones are more common weight if you are overweight. Your risk of disease increases as your weight increases. But weight loss itself, particularly rapid weight loss or loss of a large amount of weight loss of about 1 pound a week is less likely to cause gallstones.

- **Breathing problems.** Including sleep apnea (interrupted breathing during sleep). Sleep apnea is a serious condition that can cause a person to stop breathing for short periods during sleep and to snore heavily. Sleep apnea may cause daytime sleepiness.

MANAGEMENT OF OBESITY

Management of obesity is a complex task and requires a complete knowledge about the patient (obese) condition.

The general goals of weight loss and management are:

(1) At a minimum, to prevent further weight gain.
(2) To reduce body weight. And
(3) To maintain a lower body weight over the long term.

1. **Medications**

Not many medications are available for obesity treatment, and those that are have minimal long-term efficacy. The increasing knowledge that has come on the heels of the discovery of Leptin in 1994 by Friedman et al has spurred a whirlwind of research, with several potential pharmaceuticals now being evaluated in various phases of clinical trial.

The major medication groups used for obesity management are:

(1) Centrally acting medications that impair dietary intake,
(2) Medications that act peripherally to impair dietary absorption, and
(3) Medications that increase the energy expenditure.

These standards for development of obesity medications are necessarily high because most persons who are obese are fairly healthy in the short-term and need to be on these medications for extended period (possibly for the rest of their lives)

2. Dietary programs

Starvation amounts to a caloric intake of less than 200 kcal/d and is not medically indicated. It potentially is dangerous and could lead to significant starvation ketosis; electrolyte derangements; vitamin, mineral and other micronutrient deficiencies; and a significant potential for morbidity and mortality. Starvation has not been validated as an effective method of achieving significant sustained weight loss. Various types of diets are recommended for significant weight loss if taken as recommended.

How to select a diet plan

The most difficult aspect of dieting involves deciding exactly what foods to include in the daily menu. One can choose from literally hundreds of diet plans:

water diet drinking diet, zone diet, fruits or vegetable diets, fast food diets, not to mention the potentially dangerous varieties of high fat, low carbohydrate and liquid — protein diets. For individuals desperate to shed excess weight, such misinformation reinforces negative eating behaviors, causing another repeat cycle of failure.

Hence types of diets which can be choose are as following –

Very low-calorie diets (VLCDs) are best used in the setting of an established comprehensive program. They involve reducing caloric intake to 800 kcal/d or less. When used in optimal settings, they can achieve 1.5-2.5 kg/wk weight loss, with a total loss of as much as 20 kg over a 12-week period. No good quality evidence suggests that a daily calorie intake of less than 800 kcal/d achieves any additional weight loss. Use special caution whenever VLCDs are used in children, adolescents, or elderly subjects. Use is contraindicated in pregnancy and in the setting of protein-wasting states; significant cardiac, renal, hepatic, psychiatric, or cerebrovascular disease; or any other chronic disease.

Low-calorie diets (NCDs) involve a caloric intake of 800-1200 kcal/d, and they are associated with an average weight loss of 0.4-0.5 kg/wk, with a total loss of 6-8 kg in ideal settings. When using any of these LCDs, maintaining a protein intake of at least 1 g/kg of high—biologic-value protein is vital to preserve lean body mass. The major potential complications to watch for in patients on these restricted diet plans include vitamin deficiency states, starvation ketosis, electrolyte derangements, and cholelithiasis. Although useful for short-term weight loss, none of these dietary regimens alone is associated with reliable sustained weight loss.

Normal -calorie diets (NCDs) involve diets with a caloric intake greater than 1 200 kcal/d. The aim with this type of diet is to reduce the caloric intake by 500-1000 kcal/d from the current dietary intake. '[he suggested diet composition for the best-validated dietary programs should have 0.8-1.5 g/kg in body weight of protein daily (not to exceed 100 g of protein daily); 10-30% of total calories from fat (preferably at least 90% as polyunsaturated fat and <10% as saturated fat); at least 50 g/d of carbohydrates; and at least I L of water intake daily. Take care to ensure that whatever dietary plan is used provides adequate micronutrients and macronutrients based on recommended daily allowances (RDAs).

DISCUSSION

Obesity represents a state of excess storage of fat. Although very similar, the term over weight is defined as an excess body weight for height.some important a factor leading to obesity includes, social, cultural, physiological, metabolic, endocrinal ect.

Obesity leads to various health problems. it rises the risk of heart problem, hypertension, stroke, gallbladder disease, musculoskeletal problems, sleep apnea, respiratory problems ect.

Musculoskeletal problems are prevalent and their impact is pervasive. Pain and disability associated with the musculoskeletal system problem of foot due to obesity are likely to planter fasciitis, ankle sprain, gout and tarsal tunnel syndrome. All these musculoskeletal problems occur in obese people frequently.

The conditions are treated by weight reduction and control (which help to avoid reoccurrence of problem/condition) and further management is given according to the condition individually.

Physiotherapy help to treat conditions like plantar fasciitis, ankle sprain, gout, and tarsal tunnel syndrome. It includes electrotherapy and exercise therapy for it management.

Electrotherapy includes ultrasound, TENS, laser, hot packs,SWD.All these therapy help to reduce pain and facilitate healing.
As pain allows exercise program is prepared according to the condition for balancing/proprioception, strengthening and flexibility. It avoids reoccurrence of the condition.

CONCLUSION

Physiotherapy places a significant role in management of obesity and its related musculoskeletal problem of foot.

REFERENCES

1. Kopelman pg: OBESITY AS A MEDICAL PROBLEM. NATURE 404: 635, 2000.
2. Goodpaster BH, krishnaswami S, Harris TB, katsiaras A, kritchevsky SB, Simonsick EM, Nevit M, Hovoet P, Newman AB. Department of medicine, university of Pittsburgh medica center, Pittsburgh, pa 15213, USA.
3. DAVIDSON'S principles and practice of medicine. 10th edition page-301-306.
4. O'SULLIVAN SCHMITZ. Physical rehabilitation, assessment and treatment 4th edition.
5. KISNER / COLBY. Therapeutic exercise foundation and techniques. 3rd edition.
6. Dr. Christopher Melby, "Effect of acute resistance exercise on post exercise on post exercise energy expenditure and resting metabolic rate," department of food science and human nutrition, colorodo state university.
7. KEELE CA, NEIL E, JOEL N: SAMSON WRIGHT'S APPLIED PROGRAMS FOR EXERCISE, 13TH EDITION, DELHI, OXFORD UNIVERSITY PRESS 1983.
8. DeMaio M, Paine R, Mangine RE, Drez D Jr. Plantar fasciitis. Orthopedics' 1993; 16:1153-63.
9. PETER BRUKNER AND KARIM KHAN. Clinical sports medicine.
10. Daniels TR, Lau JT, Hearn TC. The effects of foot position and load on tibial nerve tension. Foot Ankle Int. Feb 1998; 19(2):73-8.
11. McMaster WC. How can chronic heel pain be treated? Postgrad Med. Apr 2001; 109(4):137-8.
12. Davis PF, Severud E, Baxter DE. Painful heel syndrome: results of non-operative treatment. Foot Ankle 1994; 5:531-5.
13. Milgrom C, Schlamkovitch M, Finestone A, Eldad A, Laor A, Danon Y. Risk factors for lateral ankle sprain: a prospective study among military recruits. Foot Ankle. 1991; 12:26-30.

14. Bailie DS, Kelikian AS. Tarsal tunnel syndrome: diagnosis, surgical technique, and functional outcome. Foot Ankle Int. Feb 1998; 19(2):65-72.