A METHODOLOGICAL ANALYSIS ON OBESITY
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ABSTRACT - Obesity is the problem of global concerned. All over the world it is considered to be the most improbable dilemma both health and appearance wise. Obesity not only makes the person to feel low in society but also indulge them with other health related disorders. Present review tries to focus on the different aspects allied with the obesity. Diseases associated with obesity and different therapies of concerned are being discussed.

Keywords: Obesity, BMI, Negative Energy Balance, Anti-Obesity Agents

INTRODUCTION
Obesity is the nutritional disorder caused by storage of excessive fat in the body as a reserve of energy. This storage of fats in the body might leads to negative outcomes. BMI (Body Mass Index) clearly indicates the difference between overweight and obese. Body Mass Index between 25 and 29.9 is consider overweight whereas BMI value 30 or above is considered as obese. The main problem with obesity is that in most cases, there is a strong tendency to regain weight; about one-third of lost weight is regained within a year, and almost all within five years. Treatment options are limited and expensive, recommended medicines are not always available, and patients experience many adverse effects.

WHO has recommended the definition of obesity based on the range of BMI (Table 1). Healthcare professionals around the world often use Body Mass Index while determining whether patients are underweight, healthy weight, overweight or clinically obese. Clinically obese persons have a higher risk of developing diabetes, stroke, cancer and cardiovascular disorders.

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Table 1. Classification of Body Weight Status Based On BMI

<table>
<thead>
<tr>
<th>BMI Value</th>
<th>Body Weight Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 18.5</td>
<td>Underweight</td>
</tr>
<tr>
<td>between 18.5 and 25</td>
<td>Healthy Weight</td>
</tr>
<tr>
<td>between 25 and 30</td>
<td>Overweight</td>
</tr>
<tr>
<td>between 30 and 40</td>
<td>Obese</td>
</tr>
<tr>
<td>above 40</td>
<td>Extremely Obese/Morbidly Obese</td>
</tr>
</tbody>
</table>

According to a research carried out in the area of USA, Canada and Western Europe it has been concluded that the daily consumption of calories in both man and women depends upon their age and working conditions/activity status (Table 2). Some studies establish the fact that people risk malnutrition if they are not consuming a well planned balanced diet. This result in demotivation and most dieters drop out before reaching their target.

Table 2. Daily Recommended Calorie Consumption (In Calorie) To Maintain Weight

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age limits (year)</th>
<th>Activity Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Sedentary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderately active</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Active</td>
</tr>
<tr>
<td>Male</td>
<td>19-30</td>
<td>2400-2600</td>
</tr>
<tr>
<td></td>
<td>2600-2800</td>
<td>3000</td>
</tr>
<tr>
<td>31-50</td>
<td>2200-2400</td>
<td>2400-2600</td>
</tr>
<tr>
<td></td>
<td>2800-3000</td>
<td></td>
</tr>
<tr>
<td>Above 51</td>
<td>2000-2200</td>
<td>2200-2400</td>
</tr>
<tr>
<td></td>
<td>2400-2800</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>19-30</td>
<td>1800-2000</td>
</tr>
<tr>
<td></td>
<td>2000-2200</td>
<td>2400</td>
</tr>
<tr>
<td>31-50</td>
<td>1600</td>
<td>2000</td>
</tr>
<tr>
<td></td>
<td>2200</td>
<td></td>
</tr>
<tr>
<td>Above 51</td>
<td>1800</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2000-2200</td>
<td></td>
</tr>
</tbody>
</table>

Causes of obesity:
Earlier it was assumed that overeating and less workout are the only causes of obesity. However, literature reviews suggests that there are many other reasons for the development of obesity. The reasons which initiate obesity can be summarized in Figure 1.

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Ailments/Symptoms allied with obesity:

There are always the risks of disease association with obese patients. Directly or indirectly accumulation of excess body fat might have harmful effect on patients’ health. In order to lose weight patients starts exerting more energy than normal resulting in a state of negative energy balance. In this state of negative energy balance, body seeks out stores of energy, such as fat or muscle to make up for the shortfall – it will start using up your excess weight. In extreme cases, this leads to the generation of obesity associated diseases.

- Coronary heart disease
- Bone and cartilage degeneration (Osteoarthritis)
- High blood pressure (Hypertension)
- High total cholesterol, high levels of triglycerides (Dyslipidemia)
- Gallbladder disease (gallstone)
- Respiratory problems
- Sleep apnea and depression
- Several cancers
- Stroke
- Type 2 diabetes

Apart from these diseases, which appears in the later stages many other preliminary symptoms evoke which need to be monitored. Patient’s emergence is adequate to arrive at a diagnosis in most cases, determined by the persons BMI (body mass index) depending on weight to height, though each adolescent may experience symptoms differently. Symptoms may include:

- Large body frame
- Difficulty in doing daily activities
- Lethargy
- Breathlessness
- Disproportionate facial features
- Breast region adiposity - (sagging fat cells) in boys
- Big belly (abdomen), sometimes marked with white or purple blemishes
- Male external genitalia may appear disproportionately small

Human studies considering flora as anti-obesity agents:

From the literature, it has been proven since long that plants and its derivatives can be used as an anti-obesity agents. All over the world researchers have carried out many clinical investigations to prove the same. Human studies however are considered to be the best allowing for use of flora in the treatment and prevention of obesity.

- Lehtonen et al. (2011) carried out a comparative study on over weight and obese women’s using bilberries. The study reveals the reduction in waist circumference as well as the body weight.
- Datau et al. (2010) through his double blind study reveals the significant decrease in body weight, waist circumference and systolic blood pressure using Nigella sativa.
- Gurrola-Diaz et al. (2010) carried double blind study on human (target) using Hibiscus sabdariffa and reach to the conclusion that the herb helps in reducing glucose and total cholesterol levels.
- Pal et al. (2011) use psyllium fibre and carried out 12 week double blind study on over weight and obese target reaching to the result i.e. significant decrease in weight, BMI and %total body fat.
- Rehman Riaz et al. (2011) find out the decrease in BMI and waist circumference in 100 obese targets using debese. The study was carried out for 2 years and also showed the Reduction of triceps skin fold.
- Snitker et al. (2009) through his randomized clinical trials on 80 healthy persons using Capsinoids reach to the conclusions that abdominal adiposity is decreased but no major change in resting energy expenditure, higher fat oxidation, overall percentage body fat is observed.
- Wang et al. (2009) use the extract of Catechin in the form of green tea on moderately over weight 182 samples. The randomized clinical trials outcome showed decrease in estimated intra-abdominal fat area, waist circumference, body weight and total body fat.

Many other researchers have also carried out the similar studies using different herbs and showed almost the same results.

Anti-Obesity Products Therapies Differences:

There are different therapies which are being used in India and across the world for the treatment and prevention of obesity. Some therapies use medication (tablet, capsule, syrup etc.) while other uses the extract, powder, tea. Some therapies also believe in massage, and hot stone therapies.
Table 3. Enlisted the Diverse Products Used In Different Therapies16

<table>
<thead>
<tr>
<th>Therapies</th>
<th>Features Of Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allopathy17</td>
<td>Direct use of the medicine to prevent and dissolve the excess of deposited fats in tissues and muscles.</td>
</tr>
<tr>
<td>Ayurvedic</td>
<td>In obese persons, digestive fire may be optimum. To improve its power, herbs like trikatu, shilajit, cyperus, kashttha, barberry, calamus, ativisha, katuka, chitraka, karanja, turmeric, guggula, arjuna, catechu, camphor, neem, rohitaka, shinshippa, apaaamarga, brahmi, bitwa are used.</td>
</tr>
<tr>
<td>Homeopathic</td>
<td>It role is bit similar to Ayurveda, but instead of herbs the crude extracts are used.</td>
</tr>
<tr>
<td>Naturopathy18</td>
<td>It focus less on diet and try to correct underlying imbalance through life style change and proper planning</td>
</tr>
<tr>
<td>Chinese therapy</td>
<td>Acupuncture</td>
</tr>
<tr>
<td>Electroconvulsive therapy</td>
<td>Often used for depression but in recent years showed significant weight loss in obese patients</td>
</tr>
<tr>
<td>Psychotherapy Or Behavioral therapy20</td>
<td>Reduces the peer pressure related to surgery and weight loss diet pattern follow-ups</td>
</tr>
<tr>
<td>Gene therapy21</td>
<td>It increases or decreases gene product and restore and maintain energy homeostasis.</td>
</tr>
</tbody>
</table>

CONCLUSION

Literature review suggested that obesity is a matter of concern. The methodological analysis on obesity clearly indicates that prevention is better than cure. Obesity is not lethal but the associated ailments may prove to be fatal if proper care is not taken. Moreover, different therapies are available with the physician which might prevent and treat obesity. Systematic reviews are available and discussed by many researchers, yet there is the need of Meta analysis for the statistical combination of the available data. This clinical based Systematic and Meta analysis might prove to be a boon for the physician for the rationalized therapies.

REFERENCES