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REVIEW ON SEDENTRY LIFESTYLE AND OBESITY

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Abstract:

Because of a sedentary lifestyle, several life-related problems occur. Obesity is one of the most life-affecting factors that can be because by a sedentary lifestyle. Obesity is a problem increasing day by day in this modern lifestyle; obesity may further lead to various diseases. Polycystic ovarian syndrome/disease (PCOS). Being overweight is the most common example of being overweight; carrying extra weight can also cause a hormonal imbalance. Being overweight may increase the risk of heart attack and many heart-related problems. Due to working from home and sitting too long in the same workplace, and kids also prefer doing their work online, because of these habits, obesity is also increasing in young people and kids. Infertility because of obesity, child obesity and obesity in pregnant women. In this modern lifestyle, children become more obese because of technology; all the school work and other educational stuff are becoming technical, which is why students prefer to do their work while sitting in the same place. Sedentary individuals can lose between 20% and 40% of their muscle mass as adults. Long periods of inactivity are linked to metabolic syndrome, heart disease, and various mental health issues. In this lifestyle, we have to become more aware of the sedentary lifestyle and its consequences. The major complications that occur because of a sedentary lifestyle are infertility in men and women, childhood obesity, various heart diseases, type 2 diabetes, cancers, stroke and hypertension. There are many non-pharmacological and pharmacological management of obesity. Pharmacists and physicians have to play an important role to aware people and guiding them properly about a sedentary lifestyle and its bad impact on health.

Keywords: *Sedentary lifestyle, Obesity, Body mass index (BMI), Pharmacological management, Role of pharmacist and health physician on public health.*

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INTRODUCTION:

Sedentary lifestyle is the new epidemic in this modern era, sitting too long while working on laptops or on mobile phones. Using mobile phones for too long can reduce physical activity and lead to obesity. Obesity is a problem increasing day by day in this modern lifestyle; obesity may further lead to various diseases. Polycystic ovarian syndrome/disease (PCOS) [1]. Is the most common example of being overweight, carrying extra weight can also causes the hormonal imbalance. Being overweight may increase the risk of heart attack and many heart-related problems. Due to working from home and sitting too long in the same workplace, and kids also prefer doing their work online, because of these habits, obesity is also increasing in young people and kids. [1,2]

BMI Range	**Classification**
18.5 - 24.9	Normal weight
25.0 - 29.9	Overweight
30.0	Obese

$$\textbf{BMI} = \frac{\text{Weight in kilogram}}{(\text{Height in meter})^2}$$

Obesity is a chronic metabolic disorder characterized by excessive accumulation of body fat. Obesity is increasing because of the modern lifestyle, and due to this, we are also inviting various health problems. Obesity has become a very serious health condition nowadays; obesity may lead to various life-threatening diseases. Excess body fat, especially visceral fat, causes metabolic issues like insulin resistance, type 2 diabetes, high cholesterol, and high blood pressure [3]. People with obesity often face heart problems, such as coronary artery disease and stroke. Furthermore, obesity raises the risk of breathing problems, including sleep apnea, as well as musculoskeletal issues like osteoarthritis and certain cancers, such as breast and colon cancer. There are also psychological effects, including low self-esteem and depression. In short, obesity greatly reduces quality of life and raises the chances of illness and death. [4, 5]

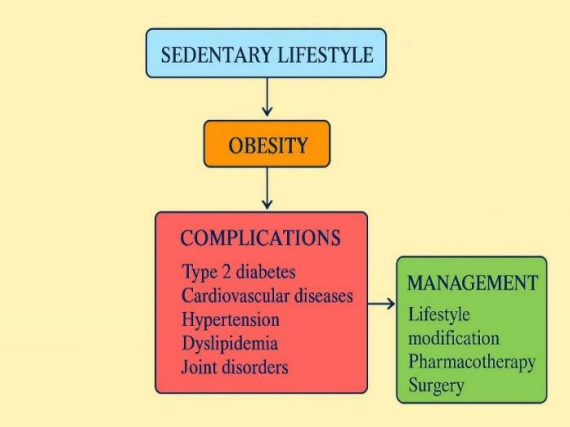

Fig. no. 1. Obesity and its complications.

Definition of sedentary lifestyle and obesity

Sedentary lifestyle

A sedentary lifestyle is characterized by a lack of significant physical activity and extended periods of sitting or lying down while awake.

Obesity

Obesity is defined as a chronic medical condition characterized by an excessive accumulation of body fat that presents a risk to health.

Health complications occur with a sedentary lifestyle and obesity

Infertility because of obesity

Infertility in both genders has become a very common problem these days, due to excessive fat accumulation in the body and sedentary behaviour; the quality of life becomes very poor. The reduction in physical activity increases obesity. Obesity is a significant factor in both men and women due to its adverse effects on hormonal balance and reproductive function. A healthy lifestyle is the key to good reproductive health. Erectile dysfunction is increasing in young men, and PCOS in women. A regular menstrual cycle is very important for fertility; irregular periods happen because of a sedentary lifestyle and an increase in obesity. In men, obesity reduces the testosterone levels that affect the sperm quality. That is why infertility is increasing.[6]

Obesity in children

The obesity in children is increasing because of a sedentary lifestyle. In this modern lifestyle, children become more obese because of technology; all the school work and other educational stuff are becoming technical, which is why students prefer to do their work while sitting in the same place. They refuse to communicate with each other, also they don't interact with their parents. Eating and doing work in the same place makes them gain weight. The risk of a child becoming obese is significantly higher if their parents are obese, with chances increasing depending on how many parents are obese. A child with two obese parents has about an 80% chance of obesity, while a child with one obese parent has a 50% chance. [7,8]

Heart-related complications because of obesity

Obesity is a major risk factor for various cardiovascular diseases due to its adverse effects on lipid metabolism; excess body fat leads to increased blood cholesterol. The imbalance causes atherosclerosis, the buildup of fatty plaques in arteries, which can cause coronary artery disease and heart attacks. Obesity also causes hypertension by increasing blood volume it also causes heart failure. Obesity makes individuals insecure about themselves, which produces chronic stress, which is bad for heart health. Thus, maintaining a healthy body weight is essential for preventing heart-related complications and improving overall cardiovascular health.[9]

Non-pharmacological management of obesity

Non-pharmacological management is the first approach in treating obesity. Involving physical activity and reducing a sedentary lifestyle, lifestyle changes and living life more enthusiastically, including a healthy diet and exercise, helps to reduce obesity naturally. Avoiding junk food and packaged food also helps to manage a healthy weight. Including fruits in the diet, like pomegranate and blueberries are very essential for the overall health of obese people. Sleep also plays a significant role in managing obesity. 8 hours of sleep is very important in maintaining a healthy lifestyle, sleeping on time before midnight also helps the body to function properly and manage the ideal weight.[10,11]

Lifestyle changes

Lifestyle or behavior changes, eating less, and being more active are ways to lose weight. The effectiveness of these methods is partly shown by data from two big studies. Factor like how many behavior sessions someone attended, how many meal replacements they used, and how much physical activity they did each week were linked to weight loss after 1, 4, and 8 years[10]. A review of the evidence found that if these methods are given in at least 14 face-to-face sessions (either in a group or one-on-one) over 6 months, and the treatment continues for another year, the average weight loss is about 8 kg. While this may seem small, it leads to important improvements in blood pressure, triglycerides, HDL levels, blood sugar control, and lowers the risk of developing type 2 diabetes. Based on these and other findings, the US Preventive Services Task Force recommends that people with obesity and heart disease risk factors should be referred for lifestyle treatment. The US Center for Medicare and Medicaid Services also supports policies that help pay for intensive behavior therapy for people with obesity. In the UK, the National Institute for Health and Care Excellence suggests using more intensive interventions depending on the level of overweight or obesity and the presence of other health problems. In the first two months, how much weight someone loses can predict their weight loss over the next 4 to 8 years, People who lost less than 3% of their body weight in the first two months were about 2.5% heavier than the average starting weight at 8 years. Those who lost between 3% and 6% were around 4.5% heavier, and those who lost more than 6% were roughly 7% heavier on average. This data suggests that losing more weight early on is beneficial. Many different types of commercial weight loss programs can be helpful for some people. The cost and way these programs are delivered can affect how well people stick with them and how practical they are in real life [10,12]. On average, these programs lead to about a 3% weight loss each year, but people usually don't keep up with them long-term. There aren't many studies that follow people for more than a year. A meta-analysis comparing these different diets found that the differences between them weren't significant.[10,11.12]

Diets for weight loss

When choosing a diet for weight loss, several important factors must be considered. The diet should provide fewer calories than what the body needs to function normally, and it should be something the person can stick with long-term. It might also offer additional health benefits. To meet the calorie reduction goal, a person could lower their daily intake by about 500 calories below their usual needs, or follow a specific diet plan. For women, this might mean eating between 1200 and 1500 calories a day, and for men, between 1500 and 1800 calories a day. If someone weighs more than 150 kg, they might need an extra 300 calories per day for each sex. In addition to cutting calories, some eating patterns may also help with overall health. Some people believe there is a perfect weight loss diet that helps reach an ideal weight while allowing them to eat as much as they want, as long as they choose the right foods [13]. This belief has led to many studies looking at different amounts of fat, protein, or carbohydrates in the diet. Various types of diets, like low-fat, low-carb, high-protein, low-glycaemic-index, and balanced calorie-deficit diets, have been compared in many studies and summarized in a few meta-analyses. One major study, called the POUNDS Lost study, involved 811 people who were overweight or obese, and it compared diets with different percentages of fat and protein. When choosing a diet for weight loss, several important factors must be considered. The diet should provide fewer calories than what the body needs to function normally, and it should be something the person can stick with long-term. It might also offer additional health benefits. To meet the calorie reduction goal, a person could lower their daily intake by about 500 calories below their usual needs, or follow a specific diet plan. For women, this might mean eating between 1200 and 1500 calories a day, and for men, between 1500 and 1800 calories a day. If someone weighs more than 150 kg, they might need an extra 300 calories per day for each sex. In addition to cutting calories, some eating patterns may also help with overall health [14]. Some people believe there is a perfect weight loss diet that helps reach an ideal weight while allowing them to eat as much as they want, as long as they choose the right foods. This belief has led to many studies looking at different amounts of fat, protein, or carbohydrates in the diet. Various types of diets, like low-fat, low-carb, high-protein, low-glycaemic-index, and balanced calorie-deficit diets, have been compared in many studies and summarized in a few meta-analyses. One major study, called the POUNDS Lost study, involved

811 people who were overweight or obese, and it compared diets with different percentages of fat and protein. No difference in weight loss was seen at 6 months or within 2 years. A meta-analysis comparing low-carbohydrate and low-fat diets found that low-carbohydrate diets are at least as good as low-fat diets for losing weight and improving metabolic risk factors. A systematic different diets also found that no single diet was better than the others. [13,15]

Very low-calorie diets, which provide between 200 and 800 calories per day, offer a much lower amount of energy compared to normal diets. This can lead to faster loss of body fat and overall weight. Some research has found that these diets can quickly bring blood glucose levels and other health risk factors back to normal in people with type 2 diabetes. However, systematic reviews suggest that while these diets lead to quicker weight loss at first, the amount of weight lost after a year or more is similar to that achieved through more comprehensive or multi-component approaches. Because of this, these diets are not generally recommended for routine use, though they may be considered if rapid weight loss is needed for medical reasons [16]. A study by Gudzune and others looked at commercial weight loss programs and found that very low-calorie diets, which are usually supervised by healthcare professionals such as health led to at least 4% more weight loss in the short term compared to just receiving advice. However, this effect started to fade after 6 months. [17]

Surgical procedures to treat obesity

Bariatric surgery has quickly become a common treatment option for severe obesity, especially since the development of less risky laparoscopic techniques. In 2013 alone, nearly half a million procedures were performed worldwide. A variety of procedures are now well-established, each leading to different levels of weight loss. Every procedure has its own set of risks and benefits that must be carefully considered for each patient. Long-term studies on the outcomes of bariatric surgery have generally shown positive results. The Swedish Obese Subjects study followed 2000 patients for up to 20 years after surgery, including procedures like banded gastroplasty, gastric banding, and Roux-en-Y gastric bypass, which were originally done using open techniques but have since been replaced by laparoscopic methods. The study found a 24% lower mortality rate, mainly due to reduced risks of heart attacks and cancer (especially in women), compared to an observational control group. Many other health conditions, such as type 2 diabetes and sleep apnea, also improved significantly, and patients consistently reported better quality of life. One of the most notable and rapid improvements has been seen in patients with type 2 diabetes, especially after gastric bypass. This suggests that some of the metabolic improvements are not just a result of weight loss. Head-to-head randomised controlled trials comparing surgery with medical treatment for type 2 diabetes consistently show better results in terms of glucose control and other risk factors for the surgical group. Observational data also suggest that the future risk of diabetes-related microvascular complications is lower in patients who undergo bariatric surgery.[16,18]

Macrovascular complications are also reduced. This has led to the idea of metabolic surgery, and changes in guidelines and recommendations to lower the standards for considering surgery in people with type 2 diabetes, especially those who have recently developed the condition. It now includes patients with a BMI between 30 kg/m² and 35 kg/m², and there is a shift away from using BMI as the main factor to decide if someone is eligible for surgery. 32,100,101 These positive results need to be understood in the context of possible risks and side effects of surgery, which can be upsetting or even disabling for some people. Although the risk of death is low with modern laparoscopic surgery, the rate of needing re-operation due to complications is high, especially with gastric banding. Some patients find it difficult to adjust to the big changes in how much and what kind of food they can eat after the procedure. Lifelong replacement therapy and monitoring are needed to prevent nutritional deficiencies, especially after surgeries that affect the way the body absorbs nutrients. Conditions like dumping syndrome, gastroesophageal reflux, and hypoglycemia can be very distressing and difficult to treat. Weight regain is also a major issue, and revisional surgery comes with higher risks and no assurance of success; there's growing emphasis on lifestyle programs after bariatric surgery to lower the Chances of this happening.32 From a clinical point of view, patients and healthcare providers thinking about referring someone for bariatric surgery should be fully informed about the risks and benefits. Good practices may include providing a thorough education session, attending patient support groups, and receiving detailed lifestyle advice and psychological support both before and after the surgery.[17,18]

Pharmacological management of obesity

Drugs that reduce food intake

By reducing hunger, anorectic drugs help decrease the amount of food a person eats, which can lead to losing weight and fat over time. These drugs can be helpful in a broader plan to lose weight, but they should only be used as part of such a plan. [19]

Noradrenergic drugs

All the currently available appetite-suppressing drugs, except mazindol, are based on a chemical structure called phenylethyl. Amine, which includes amphetamine, phenmetrazine, amfepramone, diethylpropion, phentermine, and

phenylpropanolamine, are noradrenergic drugs that either release norepinephrine or stop it from being reabsorbed by neurons in the hypothalamus. The exception is phenylpropanolamine, which works as an alpha-1 adrenergic agonist. [19,20]

Among the catecholaminergic anorectics, amphetamine and phenmetrazine are not recommended anymore because they have strong stimulating effects and a high risk of addiction. Amfepramone (diethylpropion), phentermine, phenylpropanolamine, and mazindol have less stimulating effects but still help with appetite suppression. Some people may experience side effects related to the sympathetic nervous system. These drugs should be used carefully due to the risk of psychological dependence and abuse, although most people who are overweight do not face this problem. Recently, more severe side effects, like pulmonary hypertension10 and heart valve disease11, have been reported, but most cases were seen when these noradrenergic drugs (mainly phentermine) were used together with fenfluramine (see below). Interestingly, intermittent use is as effective and more cost-efficient than continuous use of these catecholamine-based drugs. [21]

Serotoninergic drugs

like fenfluramine and dexfenfluramine are processed by the liver into d-norfenfluramine. This substance helps increase the release of serotonin from nerve cells and acts as an agonist for 5-HT2C receptors. Additionally, d-fenfluramine also prevents the reabsorption of serotonin back into the nerve cells. These actions together help reduce the amount of food a person eats. The effectiveness of fenfluramine (60 mg/day) and dexfenfluramine (2 to 15 mg/day) has been shown in both short-term and long-term studies over the past 30 years. Their results were almost as good as those of noradrenergic drugs. Unlike catecholaminergic drugs, serotoninergic drugs are meant to be taken regularly, and they don't have stimulating or sympathomimetic effects, nor do they lead to tolerance. However, even though these drugs were thought to be safe, reports of pulmonary hypertension and, more recently, heart valve problems have been published. Although only a few cases of valve disease have been linked to using these drugs alone, these serious side effects led the Servier company to carefully remove both fenfluramine and dexfenfluramine from the global market. It's still not clear whether using these drugs alone significantly increases the risk of heart valve disease, the serious side effect that caused their quick withdrawal in mid-September 1997. [21,22]

Drug affecting both norepinephrine and serotonin

Drug combinations. Since both norepinephrine and serotonin influence eating behavior, and since there are drugs that act on either of these chemicals, there was a strong temptation to combine them. Especially in the US, phentermine with fenfluramine was used, and in some European countries like Belgium, amfepramone with fenfluramine was used. The idea was to make the weight loss effect better or to reduce side effects by using lower doses of each medication. The combination of phentermine and fenfluramine got a lot of attention in the US after a long-term study suggested it was both effective and safe. These results were later supported by another large study. However, recent reports have raised concerns about serious heart valve problems linked to this combination, along with the risk of pulmonary hypertension. These findings have now cast doubt on the use of this combined treatment. [22,23,24]

Pancreatic lipase inhibitor

One new gastrointestinal lipase inhibitor is orlistat (tetrahydro-lipstatin/THL), which is a derivative of the naturally occurring lipase inhibitor lipstatin Orlistat reacts with gastric, pancreatic, and pancreatic carboxylester lipases to form a relatively stable orlistat-enzyme adduct. As a result, the breakdown of triglycerides and the absorption of free fatty acids and monoglycerides is reduced, and more fat is excreted through feces. Orlistat specifically targets lipase and does not affect the activity of other hydrolases such as amylase, trypsin, and pancreatic phospholipase A2. However, the inhibition of pancreatic carboxyester lipase leads to a decreased breakdown and absorption of lipid-soluble vitamins. [24,27]

In human volunteers, taking 120 mg of orlistat three times a day resulted in the excretion of about 30% of ingested fat and a daily caloric deficit of approximately 200 calories. In various parallel-groups, placebo-controlled studies with treatment periods ranging from 6 to 24 months, patients who received orlistat lost more body weight and were more successful in maintaining the weight loss compared to control subjects who only received a calorie-restricted diet. Additionally, orlistat reduced plasma total cholesterol and LDL cholesterol more than would be expected from weight loss alone. Orlistat-treated patients with type 2 diabetes experienced greater weight loss and improved glycemic control. The dose of oral hypoglycemic medication could decrease more than in the placebo group. However, patients experienced side effects like abdominal pain, diarrhea, gas, loose stools, or occasional anal leakage. Usually, how well someone tolerated orlistat depended on how much fat they ate. When people ate a lot of fat, they could not tolerate as much of the lipase inhibitor compared to those on a low-fat diet. Also, orlistat reduced the average levels of fat-soluble vitamins D and E, and beta-carotene in the blood, but most patients' vitamin levels stayed within the normal range for clinical use. [28,29,30]

CONCLUSION:

A lack of physical activity has become a big problem for public health in today's world, greatly contributing to the growing issue of obesity worldwide. Spending too much time sitting and not eating well can lead to many health problems like heart disease, type 2 diabetes, infertility, high blood pressure, and different types of cancer. Both kids and adults are being impacted more because they spend so much time in front of screens and don't get enough exercise. To deal with obesity effectively, it's important to make changes in daily habits, such as exercising regularly, eating healthy foods, and getting enough sleep. In some serious cases, medicine or surgery might be needed, but preventing obesity through education and changing behaviors is the best way to handle it. Doctors and pharmacists, in particular, are key in helping people understand and take steps toward healthier and more active living.

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