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Global Obesity Epidemic Trends and Management Dilemmas: Coping Strategies Based on the Case of China

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Abstract: Obesity has become the most challenging public health issue globally. The prevalence rate has grown extremely fast over the past 20 years. The global and Chinese epidemiology data revealed that obesity reached pandemic levels in the past 50 years. The increasing financial expenditure of obesity is associated with obesity-related diseases, including cardiovascular diseases, diabetes, motor system diseases, kidney disease, respiratory diseases, and psychological problems. According to the economic data analysis, obesity and the associated diseases have driven a significant growth of investment, and the cost has been a big burden for the majority of countries, especially for developing countries. Thus far, obesity prevention and treatment strategies have not been successfully set up and executed. As a result, obesity has not been efficiently managed globally. Furthermore, China's obesity management is behind in policies, system setting, medical system, economic investment, etc., compared with the US or the EU. This article researches the epidemiology, health impacts, economic impacts, and current prevention and treatment of obesity. The result shows the importance and urgency of taking immediate action globally to control overweight and obesity. In particular, the article tries to draw attention to the low-income countries who have not considered obesity as a key challenge until now. In addition, managing obesity requires global cooperation and strong governance support to set up and execute the short-term and long-term strategies and plans. Both prevention and treatment are quite critical to control obesity. Finally, the article explores three dimensions to help manage obesity in China and aims to provide constructive suggestions to change the status quo of obesity.

Keywords: Obesity Epidemiology, Chronic Diseases, Obesity Management in China.

1. Introduction

Obesity is associated with various diseases, including diabetes, cardiovascular disease, motor system and respiratory system diseases. Some diseases might lead to death, such as heart failure or stroke, etc. Based on the global obesity guideline, the disease is defined as abnormal or excessive fat accumulation, which is associated with various diseases. The body mass index (BMI, kg/m^2) is a universal standard and key indicator for assessing obesity. In China, a BMI of 24–28 is classified as overweight, while a BMI of 28 or above is defined as obesity. A BMI of 28.0–32.5 is considered mild obesity, 32.5–37.5 as moderate obesity, 37.5–50 as severe obesity, and 50 or above indicates

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extremely severe obesity. In 2019, an estimated 5 million noncommunicable disease (NCD) deaths were caused by higher-than-optimal BMI. Rates of overweight and obesity continue to grow in adults and children. From 1990 to 2022, the percentage of obesity in children and adolescents aged 5–19 years increased globally from 2% to 8%, which is a fourfold increase. The percentage of obesity in adults 18 years and above increased from 7% to 16%, which is more than a twofold increase [1]. According to the Chinese Nutrition and Chronic Disease Status report and the standards of China, the prevalence rate of obesity in adults was 34.3%, in teenagers was 16.4% and in children was 7.9 respectively [2]. The data clearly showed that the obesity growth is significant in the Chinese population, especially in teenagers and children, which requires an urgent management strategy and multi-departmental, intimate collaboration.

Obesity is becoming a more and more common social topic globally. According to research results of the World Health Organization (WHO), 12.5 of % population globally had obesity in 2024 [1], which increased 22.5% when compared to the obesity rate in 2022 [3]. Obesity refers to a chronic disease that has excessive fat accumulation in people's bodies, which increases the risk of health issues [4]. Overweight and obesity can have a serious impact on health and cause a series of diseases, which might be accompanied by severe CV diseases and death due to stroke or heart failure. A study shows: The proportion of deaths caused by overweight and obesity diseases among all-cause deaths has increased from 2.8% in 1990, rising to 7.2% in 2019; In chronic non-communicable diseases, the proportion of related deaths rose from 3.9% in 1990 to 2019 8.0%. Deaths caused by overweight and obesity are classified as all-cause disabilities. The losses in the entire life cycle have increased significantly from 1.9% in 1990 to 6.5% in 2019; Disability related to chronic non-communicable diseases: The proportion of adjusted life year losses has increased significantly from 3.2% in 1990 to 7.7% in 2019 [5].

Currently, there is a lack of comprehensive and authoritative guidelines for the diagnosis and treatment of obesity. In order to control the rapid increase obesity population and achieve a healthier society, scientists examined several factors that contribute to obesity, including irritable bowel syndrome [6], air pollution [7], Coronary Artery Calcium [8], and provided some solutions that help people lose weight faster. China has issued guidelines to manage overweight and obesity, aims to standardize the clinical diagnosis and treatment in China, provide personalized treatment plans for patients, and continuously improve the diagnosis, prevention, and treatment level of obesity in China hospitals [3].

The article is to research the impact of obesity on health and the economy. Moreover, the obesity impact on Children and adolescents will be assessed which population has not been considered as high risky population previously. To control the obesity growing prevalence rate, and decrease the economy impact, the article will summarize the treatment methods aims to provide constructive suggestions to change the status quo of obesity.

2. Health impact of obesity

Obesity is a high-risk factor for type 2 diabetes mellitus (T2DM). Generally, the severity grade of obesity has a strong correlation with the risk of T2DM. T2DM is a disease involves hormone insulin. To produce enough energy, the blood glucose is transferred from blood to body's cell which is guided by hormone insulin. When the body has issues to produce or use insulin, the whole process will have issues. When diabetes progressed, it often results in serious complications including diabetic nephropathy, diabetic foot, eyes' disease, heart disease and stroke. Compared with T2DM patients with normal weight, obese T2DM patients are less likely to have their cardiovascular risk factors well controlled. Accordingly, the combination diseases will develop quickly in these high-

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risk patients. Some patients might lose sight, some patients might require amputation, other patients might die due to the CV disease, stroke, or heart failure.

Patients with obesity generally have dyslipidemia, among which the increase in triglyceride (TG) levels is particularly prominent, and it is positively correlated with the degree of obesity. In addition, low-density lipoprotein cholesterol (LDL-C) and total cholesterol (total cholesterol) are also common.

Obesity also linked with cardiovascular disease, such as hypertension, atherosclerosis, and metabolic syndrome etc. With the progress of obesity which might lead to coronary heart disease, heart failure, stroke, and death.

Chronic kidney disease (CKD) is one of the key metabolic diseases related with obesity. To ensure the sufficient blood to the obesity body cells, the kidneys must work harder. The continuous overloading which gives a big burden to the kidneys and finally lead to the CKD. In addition, diabetes and hypertension are two risk factors of CKD also contributes to the CKD progress. As we mentioned above, both diseases are related with obesity too. The synergistic effects have a significant impact of CKD and the progression.

Respiratory diseases are strongly related with obesity, including sleep apnea, asthma, and chronic obstructive pulmonary disease (COPD) [9]. During sleep, if too much fat accumulates in the neck, it can compress the airways and cause obstructive sleep apnea, with up to hundreds of episodes of apnea occurring throughout the night. Breathing pauses in an instant, hundreds of times every night. This usually undiagnosed disease can cause loud snoring and excessive daytime sleepiness, and increase the risk of high blood pressure, arrhythmia, and metabolic diseases.

In addition, obesity will damage the motor system. Because the body weight is supported by the legs, the obesity leads to the damage of waist and knee joints. It will cause the deterioration of osteoarthritis and low back pain.

Finally, obesity could lead to psychosocial issues, particularly in adolescents. Current culture prefers thinness as beauty. Obese children are discriminated against by their peers due to their body size. They are sensitive and self-abasement. Due to their body burden, teenagers often have low participation or poor performance in group activities or sports games, which usually leads to a lack of confidence. The obese children are more prone to depression and emotional disorders. Moreover, obesity usually represents poor self-disciplined or lazy, which further aggravates their mental health problems [10].

3. Economy impact of obesity

The fast-growing prevalence rate of obesity has become a challenging issue globally. It brings substantial pressures on country healthcare systems, hospital resources and medical reimbursement system. Accordingly, each governance predicts significantly growing economic investment in the management of obesity. The cost is not only limited with obesity, but also the diseases associated with it, including the diabetes, CV diseases, stroke, and psychological issues.

According to the World Obesity Atlas report, in 2035 the global economic impact of obesity will target $4.32 trillion per year by 2035 which is almost 3% of global GDP [11]. The growth trend is extremely significant in developing countries or lower income countries which is the opposite with common opinions. The data showed that the economic development in recent decades and fast-food popularity as well as the culture change have changed the global obesity maps. Given some traditional considered “thin” countries, such as some countries in Asia or Africa have changed to obesity high growth area, the governance should pay attention to the obesity situation and set up short-term and long-term policies to manage the situation efficiently.

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China economy has experienced great growth in recent 20 years which accompanied by a significant increase prevalence of obesity. Recent National survey data suggest that more than half of Chinese adults are now living with overweight and obesity. In China, obesity and the related diseases have costed more than 200 billion RMB in 2025. The governance projected that the cost will be grown to more than 400 billion RMB in 2030 which is almost 22% of the total medical expenses [12].

4. Current obesity treatment

The aim of obesity treatment is to reduce body fat percentage, decrease the occurrence of the associated diseases caused by obesity or alleviate their severity. Accordingly the psychological issues will be reduced or alleviated.

Based on the classification of overweight and obesity and whether there are obesity associated diseases, different treatment pathways are recommended, covering various means such as nutrition, exercise, psychological guidance and drug treatment, weight loss and metabolic surgery treatment. In addition, digital health tools such as wearable devices, smart phone with health applications, and remote monitoring devices have been developed and applied in the management of obesity [5].

4.1. Lifestyle intervention for obesity

Chinese guidelines recommended lifestyle intervention as the effective treatment of obesity, which is consistent with global guidelines. Lifestyle intervention is a key method which includes diet intervention to control the taken calories, physical intervention to increase exercise, and set up behavioral intervention to improve compliance with diet and physical intervention [13].

4.1.1. Behavioral psychological intervention

The behavioral intervention methods for obesity mainly include: (1) Behavioral skills training, coaching effective stress coping skills to avoid overeating due to emotional fluctuations. Train mindful eating to enhance the perception of hunger and satiety. (2) Goal setting and tracking, work with patients to set short-term and long-term weight loss goals, conduct regular progress evaluations, strengthen positive feedback, and enhance self-management skills [5].

4.1.2. Exercise intervention

Active exercise is an important measure for exercise intervention in obesity. For patients with obesity, exercise intervention programs should focus on patient safety.

Based on the principle of exercise risk assessment (including mechanical injury risk and exercise-induced disease risk), individualized exercise prescriptions are formulated according to the patient's BMI, physical fitness, underlying diseases, and obesity-related diseases, including exercise frequency, intensity, mode, time, total amount, as well as exercise progression during weight loss. The implementation of exercise is followed up, and dynamic assessment is conducted to gradually increase the total amount and intensity of exercise in a timely manner according to the improvement of heart and lung function and health condition [5].

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4.1.3. Medical Nutrition Therapy (MNT）

It is the fundamental therapy for the comprehensive treatment of obesity, referring to the general term for special nutritional intervention measures taken for obesity under clinical conditions, including individualized nutritional screening, nutritional status assessment, diagnosis, treatment of nutritional intervention plans, and closely monitored execution over a suitable duration. Develop personalized diet plans based on patients' metabolic status, lifestyle, and taste preferences, and provide customized processes and tools for nutritional treatment plans.

Medical weight loss diets are dietary approaches that adjust the proportion of nutrients to meet the basic energy and weight loss needs of obese patients. They mainly include energy-restricted diets, high-protein diets, intermittent fasting patterns, and low-carbohydrate diets, among others.

4.2. Drug therapy

In recent years, the research and development of weight loss drugs has made rapid progress. Especially, new weight loss drugs based on glucagon-like peptide-1 receptor agonists (GLP-1RA) have been constantly emerging, and their weight loss effects have also been continuously improving. At present, a total of five drugs have been approved by CFDA in China for obesity treatment in adult patients. Zepbound from Eli Lilly and Wegovy from Novo Nordisk are taking the leading position in the global market including China. The GLP-1 product had ignited the obesity market to meet the significant unmet medical needs because of its excellent effects and weight loss control [5]. More and more companies are encouraged to make a huge investment in the area to development of weight-loss drugs. And dual-antibodies as well as other new mechanism weight loss drugs are going into clinical development phase. According to the survey, in patients who have used GLP-1 to treat obesity, with the weight loss, the social actions and self-confidence have improved in the population. It reflects the psychological change when body weight is back to normal.

4.3. Obesity treatment in teenagers

Compared with obesity treatments in adults, the treatments in adolescents and teenagers are still limited in China. There is no enough data to support the new treatments, especially considering the adverse events related with new drugs as GLP-1. However, lifestyle intervention is regarded as a relatively safe option. Internationally, the application of bariatric drugs and bariatric surgeries for children and adolescents is very cautious. Orlistat and liraglutide has been approved by FDA in US to treat the obesity in children aged 12 to 17. However, China has not yet approved any weight loss drugs for children and adolescents [13].

5. Conclusion

Obesity has a significant impact on public health which is the most popular disease globally. This article researches the epidemiology data, health impacts, economic impacts, and current prevention and treatment of obesity. The analysis showed obesity and the associated diseases treatments bring a big burden on the national economy, especially in developing countries in recent 20 years. The investment in related medical care has been increasing significantly with the economy development in China. It is important to draw the governance attention, especially the traditional low body weight countries about the impact of obesity and overweight. In addition, Managing the obesity requires global cooperation and governance strong supports to set up and execute the short team and long-term plans. Both prevention and treatment are quite critical to control the obesity status globally.

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There are 3 dimensions to help manage the obesity in China. Firstly, from governance policy, suggest setting up 3 3-tier healthcare management system, which could support patients in easily getting the healthcare support to control their body weight. Secondly, further optimize the healthcare reimbursement system to decrease the obesity patient's economic burden and encourage the standardized treatment of obesity. Thirdly, combining the obesity prevention strategies advocated by international organizations, including the WHO, etc., promotes a series of prevention measures. Multiple departments and all aspects need to work together to help people develop healthy eating habits and keep a healthy weight.

In addition, the development of new technology in China can be applied to monitor weight loss and obesity management, including the smart phone, wearable devices, and remote-control devices, etc. Intervention projects based on new techniques can cover integrated functions, including weight management monitoring, promotion and support the compliance of behavioral intervention. It could also provide individual treatment plan by analyzing the data related to diet, exercise, weight, and other health parameters. Moreover, based on the data monitoring analysis, the new techniques could also provide adjustment via a dynamic way to support the weight loss program efficiently, and provide a timely effectiveness feedback to the users. The new technologies are predicting to greatly enhance the management efficiency of obese patients and reduce management costs, which is conducive to the long-term prevention and control of obesity.

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