THE EFFECT OF OBESITY ON RESPIRATORY FUNCTION

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Abstract: Obesity is a serious global health issue. According to the World Health Organization (WHO), the global prevalence of obesity has significantly increased over the past decades. Today, obesity affects millions of people worldwide and can lead to a range of health problems. According to 2020 data, 39% of adults aged 18 and over worldwide were obese, meaning that one in every four people suffers from obesity. Over the years, the prevalence of obesity has been steadily increasing. Obesity is not only limited to adults but is also widespread among children and adolescents. Around 18% of children aged 5 to 19 years worldwide are prone to obesity.

Keywords: obesity, apnea, lung ventilation, hypoventilation

Introduction

Obesity is a widespread issue in modern society, affecting not only the metabolic and cardiovascular systems but also negatively influencing respiratory function. The impact of obesity on the respiratory system is largely related to factors such as excess fat accumulation, restricted movement of the diaphragm and chest, and disturbances in the respiratory center. This article analyzes how obesity affects respiratory function and explores methods to prevent these issues.

Mechanisms of Obesity's Impact on the Respiratory System

Excess weight negatively impacts the respiratory process in various ways:

- **Restriction of chest and diaphragm movement**: Excess fat tissue leads to reduced movement of the chest and diaphragm, which decreases the depth of breathing.
- **Ventilation disturbances in the lungs**: Obesity reduces lung elasticity, and the process of gas exchange in the alveoli slows down.
- **Weakening of respiratory muscles**: Obesity places additional strain on the muscles involved in respiration, making it more difficult to breathe.
- **Sleep apnea and hypoventilation syndrome**: Obesity is commonly associated with sleep apnea (obstructive sleep apnea) and hypoventilation syndrome, which significantly reduces oxygen supply to the body.

Obstructive Sleep Apnea Syndrome

One of the most important respiratory system issues related to obesity is obstructive sleep apnea syndrome. In this condition, narrowing of the upper

airways can cause temporary cessation of breathing during sleep. This leads to oxygen deficiency in the body and increases the risk of cardiovascular diseases.

Hypoventilation Syndrome

In some people with excess weight, obesity-related hypoventilation syndrome is observed. In this condition, the activity of the diaphragm and respiratory muscles weakens, leading to the accumulation of carbon dioxide in the body and the development of hypoxia. The mechanism of Hypoventilation syndrome works as follows:

1. **Weakening of the diaphragm and respiratory muscles**: Due to excess fat accumulation and increased body weight, the diaphragm and other respiratory muscles weaken. This limits their functionality and reduces the effective transfer of oxygen to the lungs.
2. **Obstructive airways**: Excess fat accumulation around the neck and throat can narrow the airways. This particularly complicates breathing during sleep and leads to hypoventilation syndrome.
3. **Disturbance of ventilation and perfusion balance**: Obesity may disrupt the balance between ventilation (oxygen delivery) and perfusion (blood supply) in the lungs, preventing adequate oxygen delivery.
4. **Reduced arterial oxygen**: Hypoventilation decreases the amount of oxygen reaching the lungs, lowering the saturation of oxygen in the arteries and leading to oxygen deficiency.
5. **Increase in carbon dioxide**: Due to hypoventilation, the excretion of carbon dioxide (CO2) becomes more difficult, leading to an increase in CO2 levels in the body, which, in turn, causes an acid-base imbalance and hypercapnia (CO2 excess).

Physical Activity and Obesity

Obesity reduces respiratory efficiency, making physical activity more difficult. Obese individuals become fatigued even with light physical exertion, and their breathing rate increases. Over time, this leads to avoiding physical activity, which further exacerbates obesity.

Conclusion

Obesity has a significant impact on the functioning of the respiratory system, leading to breathing difficulties, sleep apnea, and hypoventilation syndrome. To prevent these conditions, it is essential to follow a healthy lifestyle, engage in regular physical activity, and reduce excess weight. Additionally, regular medical check-ups are recommended to prevent respiratory system diseases

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