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DYSLIPIDEMIA IN OBESITY: UNRAVELING MECHANISMS AND IMPLICATIONS FOR CHRONIC NONCOMMUNICABLE DISEASES MANAGEMENT.

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Abstract:

Background: The current study is conducted to evaluate therapeutic strategies for dyslipidemia linked with obesity. Noncommunicable chronic diseases (CNCDs) have emerged as a predominant health challenge, influenced by various factors such as genetics, congenital conditions, autoimmunity, and idiopathic causes. This essay aims to elucidate the characteristics of CNCDs, particularly focusing on dyslipidemia's association with obesity. CNCDs, characterized by their non-transmissible nature, are among the leading causes of mortality. Lifestyle modifications, including diet and physical activity, are primary interventions. However, contemporary lifestyles, marked by sedentarism and poor dietary habits, exacerbate the risk factors associated with these diseases.

Methodology: An argumentative research derived from a compilation and review of bibliographic sources sourced from databases like PubMed, Scielo, WHO, MSP, Elsevier, Science Direct, Dialnet, and others. A total of 11 articles in English and Spanish were selected based on their relevance and recency.

Contributions to my information: The paper underscores the criticality of healthy lifestyles in mitigating CNCD risks and introduces essential terms and concepts pivotal for medical training.

Conclusions: CNCDs, characterized by their chronic nature and widespread prevalence, necessitate urgent interventions. Dyslipidemia, especially when associated with obesity, presents substantial health challenges. Emphasizing lifestyle modifications, complemented by pharmacological interventions like statins, offers a promising approach to manage and mitigate these health risks.

Keywords: chronic diseases, health, dyslipidemia, obesity, lipids.

Introduction

Chronic noncommunicable diseases encompass one of the main problems for the health department today since they represent one of the leading causes of death, having a high level of risk and little care in this regard. These diseases are characterized by not being transmitted from individual to individual (Radhakrishnan, Elango et al., 2023). On the contrary, these can be due to some congenital, hereditary determination and are often autoimmune, idiopathic. Chronic noncommunicable diseases present symptoms that manifest at some point in the lives of patients whose treatment would mainly involve a change in their lifestyle, even so, if this becomes more complicated, it would include constant drug treatment and permanent. Currently there is no level of awareness of how we are eating or taking care of ourselves physically, we live in a high level of sedentary lifestyle without realizing the damage to our health that we are causing, presenting some risks such as obesity, metabolic syndrome, dyslipidemia, hypertension Therefore, the objective of this essay is to publicize the damage that these pathologies cause, creating awareness of the essentials of good medical care and the Role that pharmacology has in its treatment (Banach, Penson, et al. 2023).

Development

Overview of chronic noncommunicable diseases

Chronic noncommunicable diseases (CNCDs) are long-term pathologies whose evolution is generally slow. They represent a true epidemic that is increasing due to the aging of the population and current lifestyles that accentuate a sedentary lifestyle and inadequate nutrition, among other factors, thus currently representing one of the biggest challenges facing health systems in the world. So it is mortifying for several reasons, such as the large number of cases affected by its familiar everincreasing incidence rates, its gradual contribution to general mortality because they are the most frequent cause

of disability due to the cost high cost of hospitalization, medical treatment, and subsequent rehabilitation (de Melo Aggio, Marcon, et al. 2023)

Even so, its emergence as a public health problem continues to result from several factors: social, cultural, political, and economic changes that modified the style and living conditions of a large percentage of the population. Some brought progress and the improvement of the standard of living and cannot be reversed without an individual, social and institutional; others, unfortunately, got too many populations with greater misery and restrictions to access health systems (Islam and Adhikari 2023).

Questioning in this way the Role that pharmacology plays in CNCDs, these pathologies must be treated mainly by a change in life, improving their eating habits and physical activity, however when these diseases reach more chronic progress, they must be treated pharmacologically depending on the condition and affected organ, becoming complicated for the patient since he would have to treat himself with them daily for the rest of his life, so it is advisable to improve lifestyle habits to maintain good health (Kumar, Gezici, et al. 2023).

CNCDs are favored by factors such as rapid urbanization and no plan, the generalization of unhealthy lifestyles, or the aging of the population. We must insist on combating modifiable risk factors (excessive salt intake, smoking, sedentary lifestyle, and alcoholism) and adequately treat the metabolic risk factors (arterial hypertension, hyperglycemia, hyperlipidemia, overweight, and obesity) (Kumar, Gezici, et al. 2023)

Overview of dyslipidemia

The group of asymptomatic diseases in standard abnormal concentrations of lipids in the blood is known as dyslipidemia. Dyslipidemias are blood lipid disorders characterized by increased cholesterol levels and triglyceride (TG) concentrations or hypertriglyceridemia. They are frequent entities in medical practice, which accompany various diseases such as type 2 diabetes mellitus (DM2), gout, alcoholism, chronic renal failure, hypothyroidism, metabolic syndrome (MS), and the use of some drugs (Maleki, Abbaszadeh, et al. 2023). Therefore, dyslipidemia, with its high prevalence, increases the risk of morbidity and death from various diseases and management that occur in it, becoming a health problem in the world and our country due to the severe damage it causes in patients. Affected. Among the triggering factors are excessive consumption of fats and sugars, alcohol, hereditary defects, some medications and diseases such as diabetes, hypothyroidism, overweight and obesity. Obese adults are four times more likely to have high LDL-C and TG concentrations and low C HDL than those with normal weight (Kazemi and Mohammadi 2023). On the other hand, genetic and environmental factors interact to determine the plasma lipid levels of a person and a population and even then their prevalence varies between countries and even across years. Caucasians have concentrations of higher cholesterol compared to those found in other ethnic groups, even if they live in the same region. Conversely, Asians have lower levels high-density lipoprotein cholesterol (HDL-C); Furthermore, some countries including China, Spain and the United States, have reported declining levels of plasmatic lipids associated with a lower number of cardiovascular deaths in the last two decades. Therefore, periodic evaluations of the contribution of modifiable and non-modifiable factors that influence plasma lipid levels at the national level to design and adjust cardiovascular risk reduction programs (Joshi, Deb et al. 2023).

Obesity and dyslipidemias

Obesity is considered the most common and well-known nutritional disorder in everyone identifying as a modern world pandemic affecting people of all ages, thus being closely associated with dyslipidemia and other cardiovascular diseases. Because it is primarily driven by the effects of insulin resistance and proinflammatory adipokines, accumulating evidence suggests that insulin resistance is

the most likely link between obesity and obesity-associated dyslipidemia. These abnormalities also harm the intracellular structure of adipocytes, leading to stress on the endoplasmic reticulum and dysfunction of mitochondria. It is generally accepted that the most critical molecular mediators of obesity-related insulin resistance are adipokines, produced by adipocytes and macrophages accumulated in adenopathies. In addition, altered adipocytes are resistant to insulin, increasing lipolysis and releasing free fatty acids (FFA) into circulation. Increased concentration of FFA causes lipotoxicity, as another mechanism of obesity-related insulin resistance in non-adipose tissue (Gogna, Kaur, et al. 2023)

Prominent dyslipidemia in obesity is low blood cholesterol levels. High-density lipoproteins (HDL) (HDL-C) and apolipoprotein AI (apoA-I) so epidemiological studies have shown a strong inverse correlation between HDL-C, apoA-I, and obesity, to be more specific, it is found in the correlation of an HDL-C low with obesity is more robust with central obesity, which is characterized by deposition of visceral fat. In addition to the low level of HDL-C, in the state of obesity, the ability output of cholesterol, and the endothelial function mediated by nitric oxide, which are the significant metrics of HDL function, are impaired in obese patients or mice *whether/whether* (Singh, Sharma, et al. 2023).

Treatment

Treating dyslipidemia and even more when associated with obesity should focus on lifestyle changes, including weight loss, exercise physique, and maintaining a healthy diet. So as the first option, you should always have differences in lifestyle, thus improving resistance. However, the amount of fat eaten and total calories are the factors critical dietary factors to induce obesity and lipemia, and it should be taken into account that when the lipid disorder is modest, sometimes these nonpharmacological modifications are capable of totally normalizing it. In addition to the effect on the improvement of the figures (decrease in C-LDL and TG and increase in C-HDL), the interventions have other vascular and cardiac protection mechanisms. Still, even so, most of the patients fail to replace the treatment, and most patients do not replace pharmacological treatment (Radhakrishnan, Elango, et al., 2023).

Unfortunately, as already mentioned before, the modifications of the style of life are often insufficient to achieve weight loss and improved dyslipidemia. A recent meta-analysis of anti-obesity drugs reported a mean weight loss of 3.13 kg but notable improvements in dyslipidemia. Orlistat, which reduces TG lipolysis within the gastrointestinal system and, thus, prevents intestinal fat absorption by 30%, showed only a modest reduction in LDL-C of 0.21 mmol/L. Sibutramine, which increases feelings of satiety modulating the central nervous system, showed a decrease of 0.13 mmol/L in TGs, while rimonabant showed no lipid improvement. Lastly, the weight loss induced by bariatric surgery has been associated with decreased TG and increased HDL-C levels (Banach, Penson, et al., 2023). Therefore, if LDL-C is to be reduced, the indicated drugs are statins and ezetimibe, while statins are considered the drugs of choice for its reduction; Molecules such as fluvastatin, lovastatin, pitavastatin, pravastatin, simvastatin, rosuvastatin, and atorvastatin are currently available. Statins are competitive and selective inhibitors of 3-hydroxy-3-methylglutaryl-CoA (Hmg-CoA) reductase, the enzyme responsible for converting Hmg-CoA to mevalonate (in the cholesterol synthesis pathway) (Joshi, Deb, et al., 2023).. When cholesterol synthesis is reduced, an upregulation of LDL-C receptors occurs, with a concomitant increase in its clearance; the reduction in hepatic LDL-C levels mediated by statins increases the expression of the gene that codes for LDL-R, thus enhancing the metabolic rate of LDLC and the extraction of VLDL-C remnants, which leads to a decrease in levels of LDL (Katzung, B. G., & Trevor, 2016). Additionally, statins also increase the "output" of cholesterol from macrophages. Current evidence shows that statins reduce plasma LDL-C levels by 20%-55%, in a "dose-dependent" characteristic with a modest effect on lowering VLDL-C, IDL-C, and Tg levels

(10% - 30%), and an increase in the HDL-C level of 2%-10% (de Melo Aggio, Marcon, et al. 2023). If tolerance allows it, we must use increasing doses of statins until the LDL-c targets are achieved. Fibrates: gemfibrozil (900 mg/day) or fenofibrate (145-250 mg/day), or omega-3 fatty acids (3-4 g/day) are the drugs indicated in cases of hypertriglyceridemia, alone or in combination with each other. Both. Combination treatment is often necessary when achieving therapeutic objectives with monotherapy (Islam and Adhikari 2023) So statins also have actions that are thought to be related to other properties (antioxidant, anti-inflammatory, antithrombotic or antiproliferative) associated with their activity on G proteins. These possible effects were studied extra lipids in different cardiovascular diseases and other diseases, such as sepsis, cancer, dementia, and others. These actions would reduce the morbidity and mortality in different cardiovascular clinical scenarios, not cardiovascular, not justifiable solely by reducing Col-LDL (Kumar, Gezici, et al. 2023).

Featured ideas

- The sedentary lifestyle and the little attention that we pay today to our diet is becoming a global problem for society, which has caused a radical increase in chronic diseases.
- There are various chronic diseases, mainly diabetes, metabolic syndrome, dyslipidemias, hypertension, and cancer, of different origins but related primarily to poor health habits.
- Dyslipidemias can become risky due to their high range of morbidity and death. These are difficult to treat as they are problems associated with cholesterol since they are considered blood lipid disorders characterized by increased cholesterol levels.
- Statins revolutionized the treatment of dyslipidemias and made it possible to reduce cardiovascular risks better than other drugs, which is why their use is recommended.

Contributions to my information

The work seems to be of great importance for my medical training since I discovered new terms such as ¨hyperlipidemias¨ (the suffix emia means blood) and disorders in blood lipids characterized by increased cholesterol levels(Kazemi and Mohammadi 2023).. Awareness was also created of how important it is to have a healthy life, without bad habits, both vice and eating, knowing the variety of chronic pathologies and the complication of their treatment since, in most cases, they become permanent (Maleki, Abbaszadeh, et al. 2023).

Conclusions

Noncommunicable chronic diseases have become one of the main current health problems, characterized by a long duration and low evolution, affecting most of the population that presents terrible habits in health care.

Dyslipidemia presents a high prevalence with problems of morbidity and death, and As they are disorders of blood cholesterol levels, they are associated with issues of obesity, diabetes, and cardiovascular pathologies

Obesity has serious consequences that seriously affect health and more even when it is accompanied by pathologies such as dyslipidemia since they affect the cholesterol, high-density lipoprotein (HDL) (HDL-C), and apolipoprotein AI (apoA-I).

As the first recommendation regarding the treatment of chronic diseases non-transmissible and with a focus on dyslipidemia, it will be recommended to improve its lifestyle leading to an improved diet; however, when the case becomes aggravated, pharmaceutical treatment is chosen, with stanine as the preferred medication

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