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THE FUTURE OF THE FIGHT: THE EMERGING CHALLENGES AND FIGHT AGAINST OBESITY FOR MEDICAL SCIENCE

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ABSTRACT: The world is faced with perhaps one of the biggest challenges in today's medical world: that of the obesity epidemic. Obesity was perceived to relate to lifestyle issues; however, it has nowadays been acknowledged as a chronic and relapsing disease with multiple biologic and psychosocial components. It has widespread implications and is threatening to destabilize the healthcare system as a whole. Obesity is not only causing a significant increase in comorbidities but also breaking healthcare systems and economies as a whole. This note attempts to critically analyse and discuss challenging trends of obesity in the field of medical science.

KEYWORDS: Obesity, chronic disease, medical education, anti-obesity drugs, weight loss surgery, healthcare systems

I. INTRODUCTION: THE UNPRECEDENTED GLOBAL

"The belief that obesity is the consequence of individual 'failure,' 'weak willpower,' and 'dysfunction,' and thus something that an individual could, and perhaps should, control" is profound and has long roots in society at large and, indeed, healthcare itself. But new findings from the science of metabolism demonstrate that "obesity is caused by interactions between susceptibility, neuroendocrine regulation, gut microbiota, adipose tissue, and environment". [1]

Obesity is no longer a regional public health issue but rather a global pandemic that has never been witnessed before. According to the World Health Organization, more than a billion people across the world are actually suffering from obesity.[2] This pattern indicates drastic changes that affect the whole world in areas that include food habits, urbanization, mechanization, and the resultant lack of physical activity. It is essential to note at this stage that all age groups are now affected by obesity, including children.

The community of medical science is also faced with the task of coping with an ever-increasing incidence of obesity, while, at the same time, an ever-increasing spectrum of diseases is being attributed to it. While it was hitherto considered a risk factor, it is now increasingly perceived as a disease entity in its own right, contributing to morbidity, mortality, and health care utilization in an independent manner.[3] The strategy of coping with its downstream effects, like diabetes mellitus, hypertension, and cardiovascular disease, has proved ineffective.

Adipose tissue is considered to be a dynamic endocrine organ that secretes various mediators, including adipokines, cytokines, and inflammation mediators, which play a role in insulin resistance, endothelial damage, atherosclerosis, and carcinogenesis.[4] The pathways responsible for regulating the CNS involved in appetite, satiety, and energy expenditure are dramatically different in obese individuals to support the challenge to lose weight through behavioral interventions.

Such knowledge demands a paradigm shift in medical education and discussions in general. Obesity needs to be recognized as a chronic relapsing illness that requires chronic or individualized management rather than intermittent advice related to lifestyle changes.

II. CHALLENGES IN THE PHYSICIAN'S ROLE: BIAS, BURN

A. Weight Bias and Stigma in Clinical Practice

Weight bias has been persistent in the healthcare environment and has been formally recognized as an obstacle to optimal care in people who are obese.[5] For people who experience obesity, there may be stigmatizing talk, lack of empathy, and a tendency to attribute all symptoms to weight.

Doctors may inadvertently forsake a differential diagnosis or fail to fully utilize evidence-based treatments in obese patients. A change in anti-obesity bias requires a systematic change in educational efforts and institutional policy in supporting dignified language.

B. Lack of Proper Training and Time Constraints

Although the magnitude of the issue is great, education in anti-obesity medication is given relatively little place in university courses or higher degrees. Indeed, most specialists feel that they lack confidence when it comes to prescribing anti-obesity medicines or offering long-term advice.[6] Patient care is also hampered in primary health sectors due to time constraints and inappropriate payment structures.

The future of management of obesity might include obesity medicine certification programs, multi-disciplinary clinics, as well as payment systems that address obesity as a chronic disease.

III: THE THERAPEUTIC REVOLUTION AND LIMITATIONS

A. Anti-Obesity

Glucagon-like peptide-1 receptor agonists and dual incretin therapies have revolutionized current approaches for treating obesity. The efficacy of these drugs has been proved in randomized studies in terms of sustained weight loss of 10-20% with improvements in cardiometabolic risk factors. The action mechanism includes regulating appetite, gastric emptying, and central satiety components.

Nonetheless, concerns exist about its safety profile in the longer term, the definition of its treatment duration, gastrointestinal adverse reactions, and weight regain after stopping treatment. The high drug cost could further accentuate differences in therapeutic accessibility.

B. Bariatric and Metabolic Surgery

Bariatric surgery is currently the only definitive long-term solution for someone who is severely obese to achieve remission of metabolic conditions.[8] In spite of the strong evidence base showing declines in fatalities as well as cardiovascular events, there is a low rate of use of this procedure.

With an increasing trend of surgical candidates presenting with higher BMI's and more complex comorbid conditions, risk stratification, anesthesia optimization, and minimally invasive strategies have assumed key significance. Pharmacological management coupled with surgical interventions is the future of managing obesity.

IV. THE COMORBIDITY CASCADE: A MULTISYSTEM CRISIS

Among these risk factors, obesity is recognized as a major contributing or predisposing factor for various chronic illnesses such as type 2 diabetes mellitus, cardiovascular disease, obstructive sleep apnea syndrome, chronic renal disease, metabolic dysfunction-associated steatohepatitic liver disease, and osteoarthritis.[9] Furthermore, there exists a higher susceptibility and risk of death from various malignancies such as breast cancer, colorectal cancer, and endometrial cancer among obese patients.

This has led to a situation of highly complex patients, who require management approaches that involve multiple disciplines. Biomedical research needs to shift focus to mechanisms that are further upstream in order to prevent the progression of the diseases.

V. HEALTHCARE INFRASTRUCTURE AND ECONOMIC STRAIN

Obesity poses an enormous burden on healthcare infrastructure. More resources are required by the healthcare system, such as bariatric-rated beds, equipment, operation tables, and healthcare professionals.[10] Obesity has resulted in an increased proportion of healthcare expenditure on the healthcare system, with disability and loss of productivity impacting profoundly on the burden on society due to the syndrome.

VI. TECHNOLOGY AND DIGITAL HEALTH IN OBESITY TREATMENT

Digital healthcare innovations have scalable interventions in the management of obesity. Tele-health platforms, wearable technology, mobile apps, and artificial intelligence-powered risk stratification platforms allow for remote patient observation and management.[11] However, disparities in technology access and the lack of long-term data have impeded widespread and prudent application.

VII. PREVENTION, POLICY, AND PUBLIC HEALTH INTEGRATION

The obesity epidemic cannot be solved by medicine by itself. For prevention, a multifaceted public health strategy addressing food systems, advertising, urban design, education, and issues of socioeconomic inequality is necessary.[12] There comes a role for physicians as advocates, speaking from their experience to the public about what must be done at a population level.

VIII. CONCLUSION

The future of biomedical science is inevitably tied up with the answer that must be found to the epidemic of obesity. It is a challenge that demands a paradigm shift—instead of shame and a lack of knowledge that centers on treatment,

it is a challenge that demands a focus on integration and management. It will require more than just innovation but the ability to provide equitable care.

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