The Obesities: Various Paradigms Addressing a Single Problem

Abstract: *This article provides a commentary on the article titled “The Obesities: An Overview of Convergent and Divergent Paradigms” by Karasu. Addressing the concept of obesity from various viewpoints, the article reflects the multicausal nature of a problem many societies are facing. Despite the ongoing controversy on who is to blame for the obesity epidemic, the underlying concept of obesity remains an imbalance between energy intake and energy expenditure. These 2 components, therefore, need to be considered in synchrony rather than being separated. Similarly, the complex interaction between individual, environmental, and physiological constraints warrants a multidisciplinary approach to enhance the understanding of the regulation of energy balance rather than a separation into several different areas of “obesities.”*

Keywords: commentary; obesity; energy balance; excess body weight; physical activity; diet

The accompanying article “The Obesities: An Overview of Convergent and Divergent Paradigms” by Karasu emphasizes the complexity of the obesity problem,

which has been declared as one of the leading threats to public health.¹ The discussion of various key paradigms that have been used to address obesity provides an overview of shifts in the perception of obesity in the society. Despite the different viewpoints and approaches from various scientific disciplines, it should, however, be

limited. The interaction of various components contributing to excess weight gain, however, warrants collaboration across disciplines, rather than separation. It is highly unlikely that the obesity problem will be solved by focusing on only one of the previously mentioned constraints as obesity has been described as “a complex genetic

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pointed out that the underlying concept for excess weight gain is an imbalance between energy intake and energy expenditure over a prolonged period of time. In fact, the differences in the 5 major paradigms addressed in the article predominantly address the question of “who is to blame for obesity” (ie, the individual, physical and social environment, biology, and genetics) rather than the process of excess weight gain itself. As rightfully pointed out, our understanding of the regulation of body weight (ie, energy balance) remains

disease and a product of lifestyle choices.”² Even though specific studies may focus predominantly on biological, individual, or environmental aspects, researchers should keep in mind that “the underlying causes and paths to obesity are manifold.”³ Therefore, a multidimensional approach that focuses on commonalities across paradigms, rather than differences, is needed.

Ultimately weight gain, which is the precursor to obesity, is the result of a mismatch between energy intake and energy expenditure. Clearly, there are

DOI: 10.1177/1559827615618877. From the Department of Exercise Science, University of South Carolina, Columbia, South Carolina. Address correspondence to: Clemens Drenowatz, PhD, Department of Exercise Science, University of South Carolina, Public Health Research Center, 921 Assembly Street, Columbia, SC 29208; e-mail: drenowatz@mailbox.sc.edu.

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various avenues on how this mismatch comes about including individual, environmental, physiologic, and genetic constraints. Most likely all of these components contribute to excess weight gain as the contribution of epigenomics and the environment to excess weight gain has been observed in human beings and animals.⁴ Hill describes the obesity epidemic as a classic gene-environment interaction with a human genome that is vulnerable to excess weight gain in the present environment.⁵ Accordingly, energy intake and energy expenditure need to be considered simultaneously in the discussion of obesity. Unfortunately, Karasu focuses predominantly on energy intake, which has also been the tenor of the popular media. The focus on energy intake may be attributed to the assumption that energy intake is ultimately determined by eating behavior while energy expenditure consists of several subcomponents that are predominantly influenced by physiological constraints (ie, resting metabolic rate) or behavior (ie, physical activity). Therefore, energy intake may be presumed to be more easily manipulated. Eating behavior, however, is also affected by physiological constraints such as the sensation of appetite and signaling of satiety. There is little doubt that food restriction can successfully induce weight loss. Caloric restriction, however, is associated with an increase in hunger, which makes it difficult to sustain diet-induced weight loss over a prolonged period of time.⁶ In fact, the importance of physical activity for the regulation of energy balance has already been pointed out in the 1950s when Mayer et al suggested a minimum threshold of energy expenditure or physical activity for an accurate regulation of energy balance.⁷ Subsequent research has supported this hypothesis by showing a better regulation of energy intake at higher activity levels.⁸ Sparling et al also emphasize the synergistic interaction of diet and physical activity in the regulation of energy balance and advocate for a combined approach (ie, addressing diet and physical activity) in

order to address the obesity epidemic.⁹ It should further be pointed out that physical activity has been associated with beneficial effects on body composition, while alterations in energy intake were predominantly associated with changes in body weight.¹⁰ The benefits of physical activity regarding body composition may be attributed to differences in storage of excess calories. In general, it is assumed that excess calories are stored as fat. Lean tissue growth, however, requires energy as well and in highly active people excess calories may be used to build muscle and connective tissue rather than increasing body fat stores.

The difference in storage of excess calories also ties into another problem addressed by Karasu—the classification of obesity and consideration of obesity as disease. Despite the limitations to rely on body weight when classifying a condition that addresses excess body fat, body mass index has been commonly used to determine obesity. In addition, there is ongoing discussion on specific cutpoints to determine the state of obesity. These discussions, however, should not distract from the general problem, which is that too many people are in positive energy balance.⁶ Given that the human body has a tendency of preserving weight, independent of the state of obesity, a prevention of excess weight gain, rather than treatment of excess weight, may also be a more promising strategy in the long term.⁶ Such an approach puts less emphasis on determining specific cutpoints and focuses more on the processes associated with weight gain and weight maintenance. In order to address the question of classifying obesity as a disease, a differentiation between physiological and environmental constraints predating (ie, contributing to) or following (ie, are the result of) excess weight gain is needed. Such a distinction is of critical importance for the establishment of causal models but it ignores the possibility of a bidirectional association between obesity and various health outcomes. Overall, the increased risk for several acute and chronic

diseases with excess body weight should be sufficient to justify the continued efforts for primary and secondary preventive measures addressing obesity, independent of its classification as disease or not. Regarding intervention strategies, lifestyle modification remains the primary approach to address obesity despite the availability of various pharmacotherapies.⁹ Lifestyle choices, however, cannot be not entirely attributed to the individual; they are influenced by the environment as well as physiological constraints that affect the perception of the environment. The relative stability of body weight on a daily basis also indicates a physiological control mechanism.⁶ Physiological constraints, therefore, need to be considered in addition to influences on the conscious decision-making process in the development of intervention strategies. Focusing on only one of the major contributors to obesity will provide only limited insights, at best, but most likely hinders efforts to enhance the understanding of the complex regulation of energy balance.

In summary, it is important to consider the various avenues from which the problem of obesity can be addressed but the ultimate problem of obesity should be considered singular—a mismatch between energy expenditure and energy intake. Therefore, strategies focusing on the prevention of obesity and sustainable weight loss need to consider both energy expenditure and energy intake. Accordingly, research needs to incorporate simultaneous measurements of energy expenditure, energy intake, and body composition when examining the regulation of energy balance. As “obesity is a complex condition with many causal contributors,”¹¹ a multifactorial approach is required, which promotes collaboration across disciplines rather than a separation into various forms of “obesities.” The continued controversy on who or what is to blame for the obesity epidemic will not help in solving the overall problem. Rather, future research needs to focus on the commonalities across disciplines and

paradigms and incorporate findings across disciplines to enhance the understanding of the complex physiological and behavioral interaction that contributes to the regulation of energy balance. **AJLM**

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