REVIEW ARTICLE

The quest for optimum weight and height

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ABSTRACT

The constant pursuit for perfect anthropometric measurements is widely noticed. The reason behind this is the concept that links proper weight to better health. Additionally, taller stature is often considered as a privilege. The millennium brought about stabilization in the height as well as a positive weight trend, leading to increase in the Body Mass Index (BMI). To get taller and thinner and defy this secular trend, the nutrition standards has to be revised. For regaining the positive height trend, and before accusing the drained genetic potential, adequate protein intake with special emphasis on its quality should be ensured. Healthy food choices and enhancing physical activity level are essential to overcome the obesity epidemic but early preventive measures are equally warranted. Implementation of the proper nutritional advices in the first 1000 days of life can ensure that the dream of ideal growth parameters is achieved for the future generations.

Keywords: Height; Body mass index; Nutrition; Obesity; Protein; Weight

INTRODUCTION

Adult weight is cumulative in nature and it reflects several nutrition choices that starts early in life [1]. Indeed, there is a genetic association but hormonal regulation and epigenetic modifications have an important role for proper organ development and physiological functions [2]. The optimum weight is currently everyone's pursuit since it has often been linked to prime health [3]. A universal equation for calculating Ideal Body Weight (IBW) can be easily applied in relation to one's height [4]. Several other equations and online calculators are available for IBW estimation as well as other suggestions for hospitalized and critically ill patients [5]. Regarding the pediatric age group, they have their own growth charts to help delineate their desired weight [6]. In regard to height, being taller is often perceived as a distinguished and privileged social status despite the emphasis of Samaras that with healthy nutrition and vigorous lifestyles, shorter people are more likely to reach advanced ages without suffering from chronic diseases [7].

LITERATURE REVIEW

BMI is defined as a person's weight in kilograms divided by the square of the person's height in meters (kg/m^2) and table one shows the inference of different BMI categories in terms of weight status [8]. The weight as the numerator and square the height as the denominator makes the quest for a better height potential without the health hazards of excess weight gain legitimate to have an ideal body. Since stabilization in height and positive weight trend are becoming predominant worldwide [9], then the crucial question to achieve this quest would be "How to defy our secular trend?" (Table 1) [10].

Table 1: BMI categories in relation to weight status.

BMI	Weight status
Below 18.5	Underweight
18.5-24.9	Normal weight
25.0-29.9	Overweight
30.0-34.9	Obese
35.0-39.9	Moderately obese
40.0-49.9	Morbid obese
≥ 50	Super morbid obese

Overweight and obesity

Double burden disease exists in some developing countries when obesity crawls in while undernutrition is still prevailing [11]. Nevertheless, the real millennium epidemic is overweight and obesity in almost all the continents, rather than under nutrition [12]. Overweight and obesity has been noticed in children as well as in adults [13]. It was possible to trace the origin of obesity to the fetal life when barker and his team proposed the hypothesis of a fetal origin of adult diseases and finally, epigenetics has offered biological credibility to long-term programming of health by early exposures [14]. This positive weight trend that the millennium brought has been the focus of many researches since it is related to many diseases [15]. Consequences of obesity include an increased risk of developing the metabolic syndrome, type 2 diabetes, nonalcoholic fatty liver disease, cardiovascular disease, asthma, obstructive sleep apnea, orthopedic complications, polycystic ovarian syndrome, infertility, psychiatric disease, and increased rates of cancer, among others [16].

As regards obesity, most weight adjustment strategies depend on implementation of healthy lifestyle whether in food choices or enhancing the physical activity levels [17]. Preventive measures travel a rather long distance to start by proper maternal diet plans during pregnancy, advocating

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breast feeding practice and proper complementary feeding advices [18]. These vulnerable periods are referred to as the first 1000 days of life and experts laid stress on the promising results of proper nutrition through these valuable windows of opportunity [19]. The focus of interventions to reduce risk of obesity in later life could include: Improving maternal nutritional status during pregnancy to reduce low birthweight (low birthweight was associated with higher risk of metabolic syndrome and central obesity in adults); enhancing breastfeeding (including durations of exclusive and total breastfeeding); timely introduction of high-quality complementary foods (containing micronutrients and essential fats) but not excessive in protein [20].

Height determinants

Height has been always perceived as a genetic heritage which is true, but this statement underestimates the role of nutrition in determining height [21]. Although the incidence of diseases, social equality, health expenditure and gross domestic product values also play a significant role in determining height, it is primarily determined by nutrition and genetics in many countries [22].

Boosting the height potential: Protein consumption

Regarding boosting the height potential, Grasgruber and collaborators suggested that cessation of the positive height trend in many countries, which was routinely explained as the exhaustion of the genetic potential is rather a premature assumption and with the new improvement of nutritional standards and paying attention to the protein quality, some increase can still be expected [23]. Firstly, the need for adequate protein intake is essential but unfortunately this is becoming hard to define. Phillips and collaborators suggested that daily protein beyond Recommended Dietary Allowance (RDA) requirements, is a more ideal target for achieving optimal health outcomes in adults [24]. Similarly, Elango and collaborator suggested that even the contemporary total protein requirements for children are underestimated, which also agrees with Grasgruber and collaborators, who didn`t observe any levelling-off in many graphic comparisons of male height and protein consumption. Additionally, interactions between energy deficits and protein needs affect nitrogen equilibrium and people in energy deficit need additional protein. On the other hand, enthusiasm in providing protein in the daily meals can come at a high cost since excess protein, especially early in life, can lead to obesity. Ultimately, the advice should be adjusting the protein quantity. Clinical nutrition experts are the ones who can calculate what is needed for each age without any deviations towards excess or deficiency.

DISCUSSION

From another perspective, the true protein quality presented by the Protein Digestibility Corrected Amino Acid Score (PDCAAS) determines the overall level of the diet. Plant-based foods tend to have poorer quality protein because their proteins are less digestible as well as the fact that they contain lower amounts of some essential amino acids, particularly lysine and sometimes tryptophan (in cereals) and sulfur-containing amino acids (in legumes). There is an effect of dietary restriction of single essential amino acids including leucine, lysine, methionine and threonine on plasma IGF-1 production and ultimately height. Revising the new dietary guidelines especially those which favor grains over meat and limit the milk intake is thus a must. Additionally, the concept of complementary proteins has always been an interesting alternative for vegetarians. Earlier in 1994, Young and Pellett, explained how mixtures of plant proteins can serve as a complete and well-balanced source of amino acids for meeting human physiological requirements.

Boosting the height potential: Sleep, sports and special foods

There are many suggestions for other factors to help restore the positive height trend throughout lifetime. For instance, the association between sleep duration and growth outcomes which begins in infancy. Zhou and collaborators reported that shorter sleep was associated with a higher Body Mass Index (BMI) and shorter body length in children who slept ≤ 12 h per day at three months of age. The latter authors suggested that the small but significant relationship between sleep and growth anthropometric measures in early life might be amplified in later childhood. Additionally, some sports have been mentioned as an adjuvant factor for height augmentation. Nevertheless, no studies show that the practice of physical exercises or certain sports, especially basketball and floor gymnastics, influenced the linear growth of children or adolescents as emphasized by Alves and Alves [25]. Thirdly, special foods were also suggested to boost height; for instance, Indian Gooseberry (Amla), Indian Ginseng, cress seeds and several other herbs, but no evidence based medicine support is currently supporting any of them.

CONCLUSION

In conclusion, for impeccable health it is important to seek optimum weight starting by implementing a heathy lifestyle with special emphasis on the proper nutrition choices. Regarding improving height trend, and before blaming the exhausted genetic potential, it is essential to recuperate the nutritional standards with special emphasis on the protein quantity as well as quality. Early preventive measures can also help perfect growth parameters for future generations especially if we take advantage of all the prospects available in the first 1000 days of life; whether appropriate nutrition or adequate sleep hours.

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