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Association of energy intake and macronutrient composition with obesity in women: A review

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Abstract:

Nutrition plays a significant part in the development of NCDs like obesity. Consumption of an excessive number of void calories, an inactive way of life, and low levels of physical activity may lead to adiposity. Obesity is a significant etiological element in different NCDs like cardiovascular diseases, type II diabetes, and so forth. Evaluation of dietary input and lifestyle-related factors help determine the destiny of disease. This review paper aims at determining the association of energy intake and macronutrient composition of a diet with obesity among women. In this review paper, various research papers were studied and analysed in detail from various web sources such as PubMed, Google Scholar, Research Gate, Science Direct database. Search terms included macronutrient intake, energy intake, obese women. Results were drawn from the studies in the form of tables and observations. Conclusion was summarized further.The review feature the significance of the energy density of the dietary intake. The evidence suggests that while examining the macronutrient composition of the diet, there was no huge distinction in carbohydrate, protein or fat intake amongst the obese, overweight and normal individuals. The current evidence gives proof that the subject's body weight got affected by energy intake as opposed to the macronutrient composition of the eating regimen. There was a positive relationship between energy intake and body mass index, midriff outline, waist circumference, body fat percentage. Few examinations propose that rising day to day physical activity and diminishing dietary fat content in the eating routine might help to prevent overweight and obesity. More sources should be examined to give clear insights concerning the factors leading to rise in obesity.

KEYWORDS – Macronutrient intake, Energy Intake, Obese Women

1. Introduction

Our nutrient input creates a pathway to a healthy and disease-free life. To make sure we are getting adequate nutrients, one must be aware to incorporate all the vital macro and micronutrients into the diet.Around 13% of the world population, which contains 11% of men and 15% of the women, suffer from obesity, as per evaluations done by the World Health Organization. Age, Sex, and Region are some of the indicators for the shifts in the prevalence of Obesity. According to the National Family Health Survey, which surveys the households throughout India, observed an increase in obese women from 11% to 15% over a period of 7 years from 1998-99 to 2005-06.

Noncommunicable Diseases (NCDs) are induced majorly because of bad nutrition, faulty eating habits, and irregular physical activity (1). India has a major share of population which is affected by the NCD's. According to estimations, the deaths cause by NCD's might surge in the middle age groups by the year 2020 (2). Modern lifestyle related to easy access to meals, decreased level of physical activity, inactive lifestyle, foods with high calorie density, and immoderate amounts of watching television contributes to the increase in the incidences of NCDs (3). Women are also way more likely to have an increase as well as a decrease in their kilocalorie consumption over a span of time (4). During a study done in South India, comparing the physical activity amongst women, it was found that the women in rural areas spent more time on household activities (light to moderate physical activity), as compared to the women in urban regions (5)(6). A survey on the NCD risk factors in communities in Gujarat indicated an increased use of tobacco amongst the women in rural areas.

As compared to the women in Rural Regions, the women in Urban regions are more likely to have less amounts of physical activity. Urban women had been more likely to have central obesity in comparison to rural women (7). Astrup (2008) reviewed 13 papers and summarized that the ideal routine for eating to prevent and treat obesity is Fat-Diminished and Low-Energy-Density Carbs(8). Halton also reviewed fifty articles and summarized that diet high in protein and low in refined carbs lead to increase in thermic effect of food and fullness, which may further aid in weight reduction.(9)

The illness of Obesity was rare among early human populaces (hunter-gathers) due to their dynamic ways of life which include active work and occasionally unpredictable eating routines and food shortages. (10) They mostly ate wild plants and hunted lean animals that are low in fat. Sweeteners such as honey were uncommon, and there were no dairy food products available due to the absence of domesticated animals.(10) The ways of life changed due to development attributed to agribusiness. Furthermore, people surrendered their nomadic ways of life due to food production and adequacy (11). In the present modern world, in any case, transition in civilization and automation have prompted adjustment to kinds of food consumed, diminished requirement of actual work, expanded vulnerability to adverse material like, alcohol and tobacco (10). Weight gain can happen when energy input stays higher than energy consumption for a prolonged timeframe. Also, the nutrient composition of eating regimen may likewise influence energy balance. Fat, an essential supplement since it is ineffectively regulated both at the levels of utilization and oxidation (12).

2. Methodology

In this review paper, various research papers were studied and analyzed in detail. The relevant literature from various web sources such as PubMed, Google Scholar, Research Gate, Science Direct database. Search terms included macronutrient intake, energy intake, obese women. Results included the interpretation of the selected evidences. Conclusion was summarized further. The nature of the review is narrative, the references were chosen based on the relevance to the topic.

3. Discussion

The finding from the reviewed literature suggest that subjects who were overweight and obese consumed 125 kcal/day and 434 kcal/ respectively more than normal weight subjects.However the study did not find any evidence that macronutrient intake and body weight status is associated. The reviewed paper suggest that individual's body weight status is influenced by energy intake but not by macronutrient composition the diet. (13)A study demonstrated that obese people are twice as likely to under-report energy intake contrasted with normal weight subjects. As a matter of fact, the tendency to under-report among women spikes with higher BMIs(14)(15). It was noted that obese individuals had a tendency to under report their energy intake as compared to individuals with normal energy intake. In women, the problem of underreporting the energy intake increased with higher BMIs. (16) (17)

The Total Daily Energy intake with the absolute value of Macronutrient intake and the Macronutrient percentage are notably soaring in people with obese BMIs than in people having normal BMIs. A direct comparison between the BMI categories and the Protein percentage has been defined. This comparison is more articulated in men, but women too have a significant relation like this. ($p<0.001$ when comparing all BMI groups).Women have a statistical difference in the Fat intake percentage in the BMI groups. However, it is only found in the Obese and Normal BMI groups. Women who are Overweight and Obese have no significant difference in the consumption of percentage of Polysaccharides and Natural Sugars compared with women having a Normal BMI.In Males and Females, the consumption of the Added Sugar percentage and the frequency at which it is consumed is reduced in the BMI groups of Normal, Overweight, and Obese. The obtained data indicate a notable role of Energy in the Diet-Fat component in the Overweight and Obese People. However, the Energy in Carbohydrates and Added Sugar has no direct relationship with the occurrence of the conditions mentioned above.

4. Conclusion

The findings propose that there is no significant relationship between macronutrient composition of the eating regimen with obesity, while total energy consumption impacts the BMI of the individual essentially.

My discoveries propose that while energy intake is connected with body weight status, wellbeing experts ought to consider the evidence prior to advancing single type of macronutrient such as fat, carbohydrate and protein in the diet to address the problem of obesity. Studies suggest that prudent diet may help to lower the risk of obesity. On the contrary, western diet increases the risk of obesity. The outcomes need to be considered while creating measures to forestall and diminish the pervasiveness of obesity, both at the populace and individual levels.

5. Author contributions

Stuti Gulati designed the review. Professor Srishti Negi guided along the lines to develop the search strategy. Stuti Gulati wrote and edited the final article. It was then reviewed and approved by professor Srishti Negi as a supervisor.

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