

Brief Report

Foods; friends or foes

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Abstract. Foods are the major fuel sources of cells therefore essential for life and all living organisms. Our knowledge regarding the surrounding foods is rather little. We eat diverse foodstuff during our lives and we rarely can imagine that foods can have considerable impact on our life. Human being is considered omnivorous in respect to other animals. However, this does not mean that these foods cannot alter human biology on a badly fashion. Unfortunately, in some conditions even a normal human body has some unusual responses to some selected foods. We normally see some people who cannot eat or react to some regular diets such as nuts or fruits, seafood, vegetables and dairy products. Ingestion of them by some people may have some adverse effects presenting with skin rashes, urticaria, bloating, abdominal pain, headache, drowsiness, diarrhea or constipation or even convulsion or mood disorders. We translate these responses as “body language” in response to bad foods. This manuscripts aims to illuminate the relationship between the food intake—as in both quantity and quality—and the way human body functions, by proposing a hypothetical model encompassing what the body needs, and what harms can foods cause.

Keywords: Foods, need-harm theory, inflammation, ageing, obesity, over-feeding

Introduction

Foods are the major fuel sources of cells therefore essential for life and all living organisms. Our knowledge regarding the surrounding foods is rather little. We eat diverse foodstuff during our lives and we rarely can imagine that foods can have considerable impact on our life. Human being is considered omnivorous in respect to other animals. However, this does not mean that these foods cannot alter human biology on a badly fashion. We earn nearly all of our biologic/ nutritional needs from ingestion of foods that are necessary for our lives. This could be accomplished through taking natural and healthy foods based on our needs but this is true when all of our foods are obtained from a trusted source and be taken proportionally regarding quantity and quality. Unfortunately, in some conditions even a normal human body has some unusual responses to some selected foods. We normally see some people who cannot eat or react to some regular diets such as nuts or fruits, seafood, vegetables and dairy products. Ingestion of them by some people may have some adverse effects presenting with skin rashes, urticaria, bloating, abdominal pain, headache, drowsiness, diarrhea or constipation [1] or even convulsion or mood disorders [2, 3]. We translate these symptoms as “body language” in response to bad foods [4]. This could not be so interesting or enigmatic and seems to

be a normal event among people because adverse food reactions may appear shortly after ingestion of these foods and almost all victims can be aware of this relationship. Gluten sensitivity and celiac disease is among the most important example in this regard with increasing spectrum of conditions. Wheat is among the most popular daily diet of all people from an all races and geographical territories.

However, this scenario comes to be more complicated when these adverse reactions be displayed a lot of time after ingestion of these foods without striking symptoms during a window period. Only some intelligent scientists was able to discover the causal relationship between them and the facts behind that. The symptoms attributable to food allergy could be vague and non-specific and rarely disappear shortly after discontinuation of the culprit food. This can take several weeks to months for restoration of affected cells to get back—if any—to its normal condition. This is more complicated if the adverse reactions occur in organs other than gastrointestinal tract such as central nervous system presenting with depression, psychosis or convulsion [5].

A more complex feature is when the adverse food reactions happen to a food only in person with pre-existing medical condition like psoriasis [6], dermatitis herpetiformis [7], eczema or other rheumatic disorders [8].

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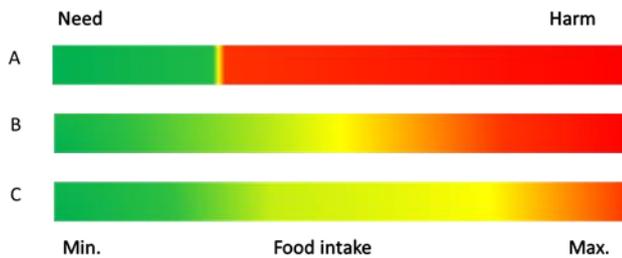


Figure 1 Need-harm theory; the diagram demonstrates different patterns of need-harm interface among people with different body habitus according to the quantity of food intake; A) Obese, B) Normal, C) Slim.

It could be supposed that many medical conditions are emerged in the context of a prone genetic with superimposed environmental factors. We are swimming in the sea of allergens and immunogens around us makes us susceptible to the wide range of autoimmune and immune mediated disorders. Essentially, all immunological triggers can complicate clinical scenarios bases on "second-hit" phenomenon.

Quantity vs. Quality of Foods

Portion size could be an indicator of food safety [9]. Overfeeding could be as dangerous as **overfueling** for an engine. Overfueling almost leads to malfunctioning or damage to a machine. This is best shown in mouse models of fat overfeeding led to renal mitochondrial overfueling and cellular damage in spite of even normal adiposity [10]. One of important issues in cell feeding is "**need - harm gap**". This gap is rather wide in normal-weight people (Figure 1, panel B) while is critically narrow in overweight/ obese people or with any metabolic risk factor like diabetes or strong family history (Fig. 1, panel A) This means that taking even small amounts of food more than actual cellular needs can acts potentially as a toxin. This overload food can be tolerated and managed during compensated conditions like exercise or hyper-metabolic states. Whereas, repeated and habitual over-feeding as occurs in obesity leads to cellular accumulation of energy packs that potentially hurt the cells and finally organs. On the other hand, in slim people without positive background for metabolic disorder we can postulate a wide need-harm gap. This may explain why some slim people can potentially tolerate more than the risky people for mitochondrial overfueling and cell damage (Fig. 1, panel C).

Besides the issue of quantity, foods may/ usually contain some non-safe contents/ additives especially when be processed industrially. The ingested dose of noxious additives seems to be an important factor in pathogenesis [11] Therefore "**quantity of bad quality**" foods also matters. The least the food the least the toxins foods impose to the body.

Fasting, Inflammation and Sirtuins

A two-year trial conducted by Meydani et al. determined the role of moderate calorie reduction of 25% on chronic inflammatory markers. Relative to the control

group, calorie-restricted subjects had diminished circulatory inflammatory markers [12]. There are translational studies revealing the effects of low-calorie intake hypothesis. In the first place, sirtuins (Sirt), an enzyme family which is found to play a key role in the ageing and inflammatory process by maintaining DNA health against oxidative stress, is said to be activated during fasting situations. In vitro and animal studies have shown prolonged life span subsequent to inducing calorie restriction to the subjects [13].

Overfeeding and Cancer

There are tremendous amounts of evidence that show near all malignancies appear more in obese people [14, 15]. This is more important in female victims than men [15]. The age of weight gain also is an important factor predisposing to cancer development. Several studies show that excess weight gain during adulthood was associated with considerable added risk for cancers [16, 17]. Proposed mechanism could be increased growth factors, over-production of estrogen via aromatization in adipose tissue and increased level of leptin and other lipid associated inflammatory cytokines [18, 19].

Conclusion

Taking together, foods as fuels supplying energy for human body machine have enormous effect on the health; considering both the quality and quantity. Quantity alone may have similar health-related destructive impacts as one may expect from a poor-quality food. Considering this important issue should be overemphasized among patients and healthcare professionals.

Conflict of Interest

Authors declare that they have no competing interests.

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