Eating Less To Slow Down Aging

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Introduction

Nowadays, 600 million people are obese worldwide. Over-consumption is the main factor of premature aging, because it causes oxidative damage and inflammation of the cells. In response to the dramatic rise in obesity, scientists and nutritionists are trying to offer numerous treatments and diets. However, there is no viable solution to stop aging, neither is there a sustainable treatment for obesity which can be applied to everyone (De Caterina R., 2006). Researchers agree that a diet limited in calories has numerous benefits in preventing the diseases caused by obesity. This research studies the benefits of a caloric restrictive diet on preventing aging.

After we eat, free radicals are produced during food processing. Free radicals can destroy cell components. To neutralize these destructive free radicals, our cells produce special antioxidant enzymes (catalase, superoxide dismutase, ceruloplasmine, transferrine, nitric oxide).

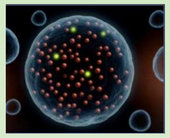
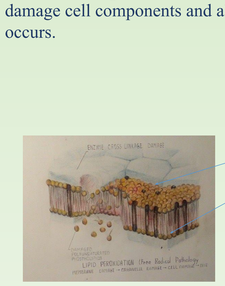


Figure *1.* *Superoxide Dismutase and Catalase can neutralize millions of free radicals per second.*

However, when there are not enough antioxidants and too many free radicals, the cells undergoes oxidative stress. During oxidative stress, free radicals damage cell components and alter their regeneration capacity. Thus, aging occurs.



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Objectives:

In order to study the benefits of this type of diet, this paper compares the amount of antioxidants in the blood of rats under dietary restriction and in rats under normal diet.

Materials and Methods

20 male rats, having the same age (12 months) and body weight (200-220 g), have been divided randomly into 2 lots:

1. The standard lot – 10 rats which underwent a normal diet- *ad libitum* (*i.e.* fed by a standard accepted alimentary diet consisting of a total of 1500 kcal). Rats had 3 meals per day, each one consisting of 500 kcal.

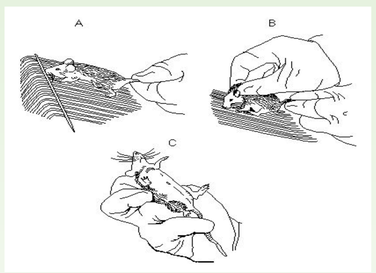
2. The studied lot – 10 rats which followed a dietary restriction of 2 meals per day during 45 days. This diet is accepted as a model for study of the benefits of dietary restrictions.

The food includes: cereals, vegetables, fish, cheese, potatoes, beetroot, carrot and bread.

Rats of both lots have been kept in rectangular cages under same environmental conditions:

- Temperature: 25-27 C^0;
- Humidity: 65-75%;
- Time of exposure to sunlight: 10-11 hours;
- Floor area/animal: 29.0 (in^2), 187 (cm^2);
- Bedding materials for the cage: paper/wood chips.

After 45 days of experiment, blood was collected from each rat and given to baoratory analysis.

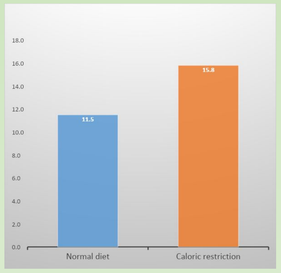


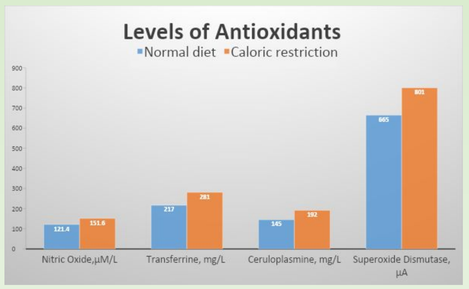
Results

The levels of antioxidants increased in the blood samples of the rats from the studied lot compared to those of the rats from the standard lot:

- Catalase : + 37,4
- Superoxide Dismutase: +18 %
- Ceruloplasmine: + 32%
- Transferrine: +29 %
- Nitric Oxide: +26 %

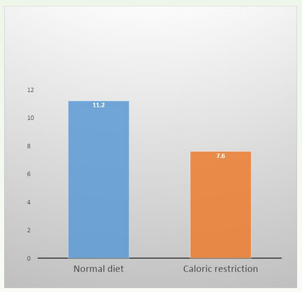
Thus, the rats under caloric restriction had a higher level of antioxidants than the rats under a normal diet.





The level of free radicals decreased for the rats under caloric restriction in comparison with the rats under normal diet:

- Malonic Dialdehyde: - 32,2 %



Conclusions

The problem of premature aging in obesity can be eliminated. Although, showed on rats, the dietary restriction can be applied on humans, as the experiment was done *in vivo* (on living organisms). It will take time, funding and governmental support to test the efficiency of this paper's proposal: to adopt a new pattern of food consumption by reducing the usual daily caloric consumption by 30 % in obese people. Moreover, simply by reducing the calories one consumes and by following the normal range of calories intake per day, may be the best solution to avoid obesity along with cancer, heart diseases, and diabetes. If this pattern of consumption will be implemented, the government will spent less money on the prevention, diagnosis and the treatment of these diseases. Furthermore, having a caloric restrictive alimentation will improve the quality of people's lives, and will delay ageing.

References

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Limitations

Although the research proves the benefits of dietary restriction on increasing life span, one should know that ageing is also likely to be a multifactorial process and not reducible to any one single cause. Free-radical damage might not be the primary cause of the ageing process. Longevity also depends on genetic material, environmental factors, life style. Moreover, further research is necessary to find a way to avoid the cell free radical damage, which becomes more accelerated with age.

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The effects of caloric restriction on the biological indices of homeostasis

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THE EFFECTS OF CALORIC RESTRICTION ON CERTAIN BIOLOGICAL INDICES OF HOMEOSTASIS

Abstract

It is estimated over 600 million people are obese today. Over-consumption of food is the main factor of premature aging, because it causes oxidative damage and inflammation of the cells. In response to the dramatic rise in obesity, scientists and nutritionists are trying to offer numerous treatments and diets. However, there is no viable solution to stop aging, nor is there a sustainable treatment for obesity which can be applied to everyone (De Caterina R., 2006). Researchers agree a diet limited in calories has numerous benefits in preventing the diseases caused by obesity. This paper studies the benefits of a caloric restrictive diet on preventing aging. In order to study the benefits of this type of diet, this paper compares the amount of antioxidants in the blood of rats under dietary restriction and in rats with normal diet. The results of the experiment can be used to explain how a dietary restriction can increase longevity. The findings might be useful in convincing people to adopt a new pattern in food consumption – reducing the daily amount of calories by 30 %, thus improving life quality.

Key words: over-consumption, oxidative damage, free radicals, dietary restriction

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