Neutropenic diet and quality of food: a critical analysis

Adriana Garófolo

Escola Paulista de Medicina, Universidade Federal de São Paulo – UNIFESP, São Paulo, SP, Brazil

The use of low microbial diets for immune-suppressed patients is controversial[1]. Low microbial diets are intended to reduce the ingestion of bacterial and fungal contaminants by the exclusion of uncooked fruits and vegetables, undercooked eggs and meat, un-sterilized water, un-pasteurized dairy products[2].

In this issue of the Revista Brasileira de Hematologia e Hemoterapia, Galati et al. report on an investigation of the microbiological profile and vitamin C content of raw and cooked foods destined for neutropenic patients[3].

The use of a low microbial diet or neutropenic diet after hematopoietic stem cell transplantation (HSCT) was instituted more than 30 years ago as a means of preventing infection from organisms colonizing the gastrointestinal tract. Evidence supporting this practice is lacking however, and the actual efficacy of neutropenic diets remains unknown[1,4].

Some argue that insufficient research and the high cost of these diets is enough reason not to implement them. Thus, the policy of some institutions has discontinued their use, such as in the Northwestern Memorial Hospital in Chicago, which stopped the practice of neutropenic diets in 2006[4]. Nevertheless, others argue that despite lack of clinical evidence, it is prudent to be cautious and continue to provide immune-suppressed patients with low microbial diets[1,2,4], which implies, in turn, higher dietary restrictions.

A recent study followed patients admitted to a high-efficiency particulate air-filtered room (protected environment) receiving induction therapy for newly diagnosed acute myeloid leukemia (AML). They were randomly assigned to a diet containing no raw fruits or vegetables (cooked diet) or to a diet containing fresh fruit and fresh vegetables (raw diet). The rates of major infection and death, the two major end points of the study, were similar regardless of whether patients were on the cooked or raw diet[5].

A retrospective study of 726 consecutive HSCT recipients studied 363 who received a neutropenic diet and 363 who received a general hospital diet in order to determine the incidence of microbiologically confirmed infections during and after transplantation. The study demonstrated a higher rate of infections in the HSCT recipients who received the neutropenic diet[6].

Although there is an international trend in not maintaining severe dietary restrictions for immunosuppressed patients, including HSCT, a Brazilian study carried out recently showed that there are still differences among professionals concerning which foods are allowed, especially during the critical period of immunosuppression (CPI)[7].

In the international literature several foods, such as pasteurized yogurt and cheese, thin-skinned fruits and chocolate are allowed during CPI. However, the study by Vicenski et al. demonstrated that in most Brazilian centers (88%) the consumption of these foods is not allowed[7].

Some general adopted proceedings are diet served without fresh garnishes or salads, the plates are sealed with cling film, delivered to the ward, heated in a microwave oven and served still sealed. Cutlery is disinfected in boiling water before service[1,4].

The more restricted the diet of the patient is, the greater the risk of malnutrition. Thus, there will be greater need for nutritional supplementation.

Cancer patients often have reduced food intake and, in certain circumstances, malabsorption of nutrients[8-11]; these conditions can predispose to the development of nutritional deficiencies. Among the nutrients which studies have shown reduction of body reserves, are vitamin A and retinol, vitamin E, vitamin C, beta carotene, selenium, zinc and the B vitamins[12-16]. Several of these elements are restricted when neutropenic diets are used. Moreover, the practice of the cooking processes induces important nutritional losses. The high temperatures and the amount of water used in cooking are the main factors in the inactivation of nutrients. During the cooking process, including soaking, boiling, cooking in a microwave and pressure cooking, various nutritional losses are observed; reductions in the B vitamins, potassium and vitamin C have been reported[17]. Ascorbic acid (vitamin C), with its important proprieties as an antioxidant, is one of the most impaired nutrients in cooked vegetables and fruits[18,19].

Conflict-of-interest disclosure:
The author declares no competing financial interest

Submitted: 1/20/2013
Accepted: 1/27/2013

Corresponding author:
Adriana Garófolo
Escola Paulista de Medicina da Universidade Federal de São Paulo – UNIFESP EPM
Rua Sena Madureira, 1500 - Vila Mariana
04021-001 São Paulo, SP, Brazil
adrigarofolo@hotmail.com

www.rbhh.org or www.scielo.br/rbhh

DOI: 10.5581/1516-8484.20130022

The available evidence does not support the widespread use of neutropenic diets. Moreover, neutropenic diets are not standardized. Several studies have emphasized the importance of food in patients' quality of life. Patients receiving chemotherapy have many problems, including appetite disorders, malnutrition, body image changes and fear. Many patients identify appetite and weight as variables within their control and food is seen as a nurturing and comforting area of life[16]. Furthermore, greater dietary restrictions lead to higher nutritional risk and increase the need of nutritional support, thereby increasing the costs and the risk for the patient.

Based on the current evidence, we are not able to give definitive recommendations in the clinical practice, until high quality research has been conducted. Therefore, guidelines should be cautious as the conduct is empirical and there is a high risk of nutritional deficiencies in these patients. Food can also be a source of pleasure and certain restrictions may exacerbate fragile emotional states.

Some safety practices that can be adopted for patients submitted to conventional cancer treatment are the adequate sanitation of vegetables and fruits, the withdrawal of raw or undercooked meat, fish and eggs, and restricting the consumption of un-pasteurized suspicious dairy foods and food prepared using questionable hygienic care. Organically produced foods should be carefully acquired and consumed because they are at risk of containing higher amounts of microorganisms, since they are free of pesticides. Recommendations in this area are scarce.

The care of patients submitted to hematopoietic stem cells transplantation may be more rigid than for conventional anticancer treatment, with, in addition to other precautions, the avoidance of raw plant foods that are more difficult to sanitize, but the need to fully constrain this group to consume only cooked food is not fully proven.

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