

## Dementia-2014: Addressing nutritional requirements in early Alzheimer's disease: What, why and when?

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Alzheimer's disease (AD) is a progressive neurodegenerative disease with an unknown cause. Nevertheless, a number of risk factors for AD have been identified, including ageing together with genetic and environmental factors. An important modifiable life style factor that is associated with AD is diet. Many epidemiological studies have demonstrated that adherence to diets rich in fish; fresh fruit and vegetables are associated with a lower risk of developing AD. In addition, studies show that plasma levels of selected nutrients are reduced in AD; a finding that is confirmed by meta-analyses even with normal dietary intake and in the absence of malnutrition. The impaired systemic availability of these nutrients may in part be explained by compromised endogenous production, transport and transfer of nutrients over physiological barriers that evolve as a consequence of aging or disease. In addition, there seems to be an increased utilization of nutrients for AD pathology-related processes, such as the production of membrane phospholipids to stimulate synapse formation. Indeed, many of the nutrients with low plasma levels in AD are involved in phospholipids synthesis; either as precursor or as co-factor. Based on these insights, the specific nutrient combination Fort asyn-Connect (UMP, DHA, EPA, choline, phospholipids, folate, vitamins B6, B12, C, E, and selenium) was designed for the dietary management of AD. When tested in patients with early AD we not only observed elevated plasma nutrient levels, but also preserved functional brain connectivity and concomitant improvements in memory performance. Our data indicate that addressing the specific nutritional needs in early AD may offer potential in AD management. The World Alzheimer Report (2015) estimates that 46 million people worldwide are living with Alzheimer's disease (AD) and other dementias, and that this prevalence will increase to 131.5 million in 2050. In developing countries, including Brazil, this calculated rate is three to four times larger than that in developed countries. AD corresponds to 50–70% of all dementia syndromes, classified as a progressive neurodegenerative disease showing diffuse cortical atrophy with three stages of evolution: mild, moderate, and severe. Memory decline, attention, and language impairments may be seen during the disease course, followed by behavioral changes that end up spoiling the performance in basic activities of daily living and problem-solving abilities.

Despite the discovery of new treatments, there is no "cure" to stop or modify the disease course. For this reason, several non-pharmacological interventions are essential to improve the quality of life of these patients. Interdisciplinary assistance by nutritionists, psychologists, physical therapists, speech therapists, and other professionals who can provide appropriate guidance for the symptoms of these patients is, therefore, essential.

Regarding nutrition for patients with AD, weight loss and behavioral changes related to food are major objects of scientific study, as they trigger deterioration of the quality of life of patients and caregivers. The aim of this review is to show the current methods of nutritional treatments for patients with AD.

Currently, in the early stage of AD, the nutritional approach has focused on two important points: (1) to correctly orient caregivers and patients regarding prevention of body weight reductions and (2) to decrease

synaptic loss. At this stage, the patient feeds alone and important nutritional modifications are not verified. Management of the nutritional state is suggested to evaluate any changes in body weight. Regarding synaptic loss, the evolution of the knowledge on the pathophysiology of this disease has allowed the correlation of a protective factor for impaired neurons in AD. Countries that have dietary patterns characterized by high consumption of fish, fruits, and vegetables (foods that usually offer larger amounts of antioxidants and polyunsaturated fatty acids) have lower incidence of dementia.

A similar result was found in a prospective cohort study in New York where 2148 elderly without dementia followed for 1.5 years in order to verify the relationship between the intake of food groups (variation related four nutrients: saturated fatty acids, vitamin E, vitamin B12, and folic acid) and the risk of AD development found that when the action of these nutrients are evaluated in isolation to prevent AD there is no evidence of a protective effect, but when they are considered together, there is evidence that increased consumption of nuts, fish, tomatoes, poultry, cruciferous vegetables, fruits, vegetables, leafy dark green, lower intake of dairy lacteal products high in fat, and red meat may contribute to the decrease in AD development, demonstrated that the consumption of food sources of polyunsaturated fats, folic acid, and vitamin E should be encouraged at all stages of life

**Foot Note:** This work is partly presented at 2nd International Conference on Alzheimer's Disease and Dementia, September 23-25, 2014 | Valencia Convention Centre, Spain