



International Journal of Biomedical Engineering Research  
(DOI:10.28933/IJBER)



## Metabolic and immunological modifications present in Alzheimer's Disease

Gonçalves, A.L.N<sup>1</sup>, Souza, A.V.F<sup>2</sup>, Borges, B.Q.O.V<sup>3</sup>, Paiva, J.C.G<sup>4</sup>, Morais, L.A<sup>5</sup>, Souza, M.B.R<sup>6</sup>

1Estudante do Curso de Medicina – UNICAP; 2,3,4,5Estudante do Curso de Medicina – UNICAP; 6Docente do Curso de Medicina – UNICAP

### ABSTRACT

**Introduction:** Alzheimer's Disease (AD) is classified as progressive neurodegenerative and represents one of the main causes of dementia in the elderly. Its symptomatology is characterized by loss of memory, neuronal destruction and reduction of brain volume. The literature reports a series of metabolic and immunological changes that contribute to the progression of the disease. **Objective:** To carry out a review of the literature on metabolic and immunological modifications present in Alzheimer's Disease. **Methodology:** 34 articles, published between 2008 and 2017, were pre-selected in the SciELO database, using the descriptors: Inflammation + Alzheimer's Disease; Hypotheses + Alzheimer + Etiology; Alzheimer's Disease + Lymphocytes; Metabolism + Alzheimer's. After analysis of the abstracts, 4 articles were analyzed in full. **Results and Discussion:** The following metabolic alterations were observed in patients with AD: folic acid reduction, arginine reduction and increase of calcium influx to cell. Serum folic acid concentration is reduced in AD patients compared to healthy elderly individuals and has an inverse relationship with the amino acid homocysteine, which can cause apoptosis and increased oxidative stress, leading to cognitive damages that characterize the progression of the disease. Changes in NMDA receptors have also been observed, so glutamate is not reuptake and accumulates in the extracellular environment causing toxicity. In addition, as a consequence, there is a high influx of calcium leading to toxicity and apoptosis of neuronal cells. In relation to the immunological alterations, were found reduction of lymphocytes, increase of interleukin and increase of microglia, which in high quantity produce neurotoxins that contribute to the neuropathogenic mechanism of AD. In relation to the level of arginine, the amino acid involved with the energetic process, it was observed that some cells of the immune system consume it abnormally, resulting in the energy decrease and slowness of metabolism, characteristic of AD. **Conclusion:** Metabolic and immunological changes contribute to the progression of AD.

**Keywords:** Alzheimer; Changes; Immunological; Metabolics.

### \*Correspondence to Author:

Gonçalves, A.L.N  
Estudante do Curso de Medicina – UNICAP

### How to cite this article:

Gonçalves, A.L.N, Souza, A.V.F, Borges, B.Q.O.V, Paiva, J.C.G, Morais, L.A, Souza, M.B.R. Metabolic and immunological modifications present in Alzheimer's Disease. International Journal of Biomedical Engineering Research, 2018, 1:3

 eSciPub  
eSciPub LLC, Houston, TX USA.  
Website: <http://escipub.com/>