The Role of Diet Quality in Long COVID: Focus on Ultra-Processed Foods

Raquel Dal Sasso Freitas[1,2]; Bruna Alves Alonso Martins[1,3];Ana Letícia Hilario Garcia[1,2];Malu Siqueira Borges[1,3]; Daiana Dalberto[1,2]; Juliana da Silva[1,2,3]

[1]*Laboratório de Genética Toxicológica, Universidade LaSalle, Canoas, Rio Grande do Sul*

[2]*Programa de Pós-Graduação em Saúde e Desenvolvimento Humano, Universidade LaSalle, Canoas, Rio Grande do Sul*

[3]*Programa de Pós-Graduação em Genética e Biologia Molecular, Universidade Federal do Rio Grande do Sul, Porto Alegre, Rio Grande do Sul*

Introduction: Long COVID is a multi-systemic condition characterized by symptoms persisting for at least three months after acute infection. Proposed mechanisms include gut microbiota disruption, endothelial alterations, chronic inflammation, and genomic instability. Diet quality may influence the development and severity of Long COVID. High consumption of ultra-processed foods (UPFs) is linked to chronic diseases, but its role in Long COVID remains unclear. **Aim:** To assess the relationship between UPF intake, Long COVID symptomatology, and DNA damage. **Methods:** 188 individuals were recruited and divided into two groups: control (n=64) and Long COVID (n=122). Participants completed the Symptom Burden Questionnaire™ for Long COVID (SBQ™-LC) and a food frequency questionnaire. Peripheral blood samples were collected to evaluate DNA damage via the comet assay. **Results:** High UPF intake was positively correlated with Long COVID total symptom burden (r = 0.225; p < 0.05), as well as specific symptom domains including pain (r = 0.180; p < 0.05), circulation (r = 0.180; p < 0.05), fatigue (r = 0.291; p < 0.001), memory (r = 0.207; p < 0.05), ears (r = 0.222; p < 0.05), muscles (r = 0.187; p < 0.05), and eyes (r = 0.185; p < 0.05). UPF intake also showed a negative correlation with age (r = -0.262; p < 0.05) and positive associations with BMI (r = 0.209; p < 0.05) and waist-to-height ratio (r = 0.183; p < 0.05). However, no significant differences in DNA damage were observed between controls and Long COVID individuals, and no significant correlation was found between UPF intake and DNA damage as assessed by the comet assay. **Conclusion:** Long COVID significantly impairs quality of life, and diet quality—particularly high consumption of UPFs—is associated with symptom severity. However, this relationship does not appear to extend to DNA damage as measured by the comet assay. These findings shed light on the potential of dietary interventions, such as reducing UPF intake, in managing Long COVID symptoms. **Keywords:** Long COVID, Comet Assay, Ultra-Processed Food, Dietary Quality, Post-COVID-19 Syndrome. **Funding:** CNPq, CAPES