Reversal of Aspirin Non-Responsiveness in Patients with Type 2 Diabetes Mellitus: A Comparative Study Between Extra Virgin Olive Oil Supplementation and Aspirin Dose Increase

Ortega Hombrados L[1], Sánchez Tévar AM[1], Martín Aurioles E[2], Arrebola Ramírez MM[3], Rodríguez Pérez MD[1], González Correa JA[1], De la Cruz JP[1].

[1]Departamento de Farmacología y Pediatría. Facultad de Medicina. Universidad de Málaga-IBIMA Plataforma BIONAND. [2]UGC La Roca. Distrito Sanitario Málaga-Guadalhorce. UCG Laboratorio Clínico. Hospital de la Axarquía (Málaga). Servicio Andaluz de Salud.
E-mail: Hombrados@uma.es

Background:
Acetylsalicylic acid (ASA) is the antiplatelet treatment of choice for patients at high cardiovascular risk or with established cardiovascular disease, provided no contraindications exist. However, our research group has reported a prevalence of inadequate response to ASA therapy of approximately 50% (Ortega Hombrados L, et al. BCPT 2024; 135 (suppl.1): 22). Various mechanisms have been investigated to explain this non-responsiveness, including increased oxidative stress—particularly in patients with diabetes mellitus.
Objective:
To evaluate the effect of extra virgin olive oil (EVOO), as an antioxidant agent, on ASA-mediated platelet inhibition compared to increasing ASA dosage, in patients with type 2 diabetes mellitus exhibiting ASA non-responsiveness.
Methods:
We conducted a single-blind, controlled clinical trial with parallel groups. Patients with confirmed ASA non-responsiveness were randomized into two treatment arms: 100 mg/day of ASA plus 40 mL/day of EVOO (preferably at breakfast) versus 200 mg/day of ASA. Antiplatelet response was assessed using the PFA-100 system. ASA IC50 was determined in vitro before and after treatment using collagen-induced electrical impedance aggregometry. Residual platelet activation was evaluated by flow cytometry (anti-CD62 antibody), and oxidative stress and vascular inflammation biomarkers were quantified using commercial ELISA kits.
Results:
A total of 36 patients with type 2 diabetes and ASA non-responsiveness were included (18 per group; 39% female, 61% male; median age 69 years). After 1 month of follow-up, both treatment arms demonstrated restored antiplatelet response. ASA IC50 decreased by 29% in the ASA (100 mg) + EVOO group and by 32% in the ASA (200 mg) group compared to baseline, with no statistically significant difference between groups. Residual platelet activation was reduced in both groups. Biomarkers of oxidative stress and vascular inflammation showed statistically significant reductions compared to pre-treatment values in both groups, again without significant differences between them.

Acknowledgements *PI-0120-2020. Efectividad de la asociación aceite de oliva virgen extra- ácido acetilsalicílico vs. ácido acetilsalicílico cada 12 h sobre la resistencia al tratamiento antiagregante en pacientes con diabetes mellitus tipo 2. CONSEJERÍA DE SALUD Y FAMILIAS.*

TOPIC OF THE PRESENTATION:
☐ Receptors & Ion Channels
☐ Pharmacogenomics & Toxicology
☐ Cancer
X Cardiovascular
☐ Neuropharmacology
☐ Inflammation
☐ Pain
☐ Nanopharmacology
☐ Natural Products
☐ Teaching Pharmacology
☐ Others

IS THE PRESENTING AUTHOR A YOUNG RESEARCHER/INNOVATOR (any individual below 40 years of age):
X yes
☐ no

IS THE PRESENTING AUTHOR A PhD STUDENT:
X yes
☐ no