The Effect Of SGLT-2 Inhibitors on Improving Non-Alcoholic Fatty Liver Disease: A Systematic Review and Meta-analysis

Wasef Sayeh; MD[1], Sudheer Dhoop; MD[1], Sahithi Chinnam; DO[1], Rayna Patel; MD[1], Azizullah Beran; MD[2], Megan Karrick; MD[3], Anas Renno; MD[3], Ali Nawras; MD[3]

[1]Division of Internal Medicine, Department of Medicine, The University of Toledo,

Toledo, OH 43614

[2]Division of Gastroenterology, Indiana University, Indiana

[3]Division of Gastroenterology, Department of Medicine, The University of Toledo,

Toledo, OH 43614

*Corresponding author: wasef.sayeh@utoledo.edu

Keywords: SLGT-2, NAFLD

Published: 14 December 2023

Introduction: Non-alcoholic fatty liver disease (NAFLD) is the most common liver disease, and its prevalence continues to increase worldwide. Approximately 80% of patients with Type 2 Diabetes Miletus (T2DM) have NAFLD. SGLT-2 inhibitors are novel oral antihyperglycemic that work by inhibiting the absorption of glucose from the renal tubules which also causes a minor diuretic effect. They also showed huge benefits in managing T2DM, Chronic kidney disease and heart failure. Many clinical trials reported that SGLT-2 inhibitors can improve NAFLD.

Methods: We performed a comprehensive search of the databases from inception through May 15th, 2023. The primary outcome was the improvement of liver enzymes (ALT, AST). The secondary outcome was the improvement in the fibrosis index score (FIB-4). The random-effects model was used to calculate the mean differences (MD) and 95% confidence intervals (CI). A p value <0.05 was considered statistically significant. Heterogeneity was assessed using the Higgins I2 index.

Results: Eleven randomized controlled trials involving 589 patients were included in the meta-analysis. All studies compared the levels of ALT between the SGLT-2 inhibitors group and the control group which showed a significant reduction in the enzyme level in the treatment group (MD -5.02, 95% CI -7.89- -2.15, p=0.0006, I2 = 89%).Ten studies compared the AST levels which also showed a significant reduction in the enzyme level in the SGLT-2 inhibitors group compared to the control group (MD -2.51, 95% CI -3.37 - -1.65, p <0.00001, I2 = 43%). Only, four studies compared the improvement in FIB-4 and the reduction in FIB-4 was significantly lower in the SGLT-2 inhibitors group compared to the control group (MD -0.07, 95% CI -0.08- - 0.05, p <0.00001, I2 =0%).

Discussion: Our meta-analysis demonstrated that the use of SGLT-2 inhibitors can be beneficial in patients with NAFLD in terms of lowering the level of liver enzymes (ALT and AST) and lowering the fibrosis index score (FIB-4).

