

## ملخص البحث الثاني

أ- عنوان البحث: *Potential Reno-protective Influence of Canagliflozin in Male Albino Rats with Metabolic*

Syndrome *مجلة محلية* 83 – 73, 12(2), 2023, FUMJ Medical Journal University Fayoum

Hanan AA. Shamardl<sup>1</sup>, Sawsan A. Sadek<sup>1</sup>, Dina E. Shaker<sup>1\*</sup>, Amany N. Ahmed<sup>1</sup>

## الملخص باللغة الانجليزية:

### Abstract

**Introduction:** Metabolic syndrome (MetS) is a pathological condition of protein, fat, and carbohydrate metabolism. Persistent inflammation caused by MetS can affect renal structure and function. Renal inflammation due to MetS can be controlled, in part, by activating the nucleotide-like receptor protein 3 (NLRP3) inflammasome. The sodium-glucose cotransporter 2 (SGLT2) inhibitor canagliflozin has been shown to benefit people with and without type 2 diabetes by lowering metabolic risk factors and protecting renal function.

**Aim of the study:** Canagliflozin was tested for its influence on renal inflammatory changes in rats with fructose-induced metabolic syndrome.

**Materials and Methods:** Four groups of male albino rats were studied; Control, Canagliflozin (10 mg/kg/daily orally), Fructose (25% fructose in drinking water), and Fructose + Canagliflozin. After seven weeks, measurements of systolic blood pressure (SBP), IL-6 levels, the HOMA test for insulin resistance (IR), renal NLRP3 levels, and histopathological renal examination were estimated.

**Results:** Fructose-induced MetS caused significant increases in SBP, IR, serum IL6 level, and NLRP3 renal levels associated with marked renal interstitial inflammatory infiltration. Canagliflozin ameliorated IR and serum IL6 levels by 70% and 63%, respectively; SBP by 33.7%; NLRP3 renal levels by 58%; and finally, it attenuated the interstitial inflammatory infiltrations caused by MetS.

**Conclusions:** Canagliflozin has a protective renal effect in fructose-induced MetS not only by controlling glycemia but also through its potential anti-inflammatory effect. The anti-inflammatory role of canagliflozin is related to some extent to its ability to decrease the activation of the NLRP3 inflammasome.

**Keywords:** Fructose; MetS; NLRP3; Canagliflozin; kidney inflammation.