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Diabetic kidney disease, be far away from inflammation and oxidative stress

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Chronic inflammation plays an important role in the pathogenesis of type 2 diabetes mellitus (DM). Observational and clinical studies have demonstrated that increased levels of pro-inflammatory cytokines and chemokines, change in the number or activation of immune cells, and increased oxidative stress are all associated with type 2 DM. Pattern recognition receptors such as Toll-like receptors (TLRs) are responsible for initiating inflammatory cascade in diabetes, and TLR4 and 2 are known to be the primary link between diabetes and innate immunity. In diabetic disease animal model, blocking TLRs pathway decreased pro-inflammatory cytokines, oxidative stress leading to alleviation of progressive kidney injury. Blocking TLRs pathway also resulted in improvement in lipid metabolism, less inflammation on adipocytes and adipose tissues. Nicotinamide adenine dinucleotide phosphate (NADPH) oxidases (Noxs) are responsible for mediating oxidative stress in diabetes. Novel inhibitors of Noxs, have shown improvement in oxidative stress and improved progressive kidney injury in type 2 diabetic mice. Moreover, when used with angiotensin II receptor blocker, the effects were additive in protection of diabetic kidney disease. Interestingly, pan-Nox inhibitor significantly improved lipid metabolism, inflammation in adipose tissue. Protection from systemic inflammation and oxidative stress may be the key mechanism for protection against diabetic kidney disease.