

## *Involvement of visceral adipose tissue in the development of vascular damage in chronic kidney disease*



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### **SHORT SUMMARY:**

Chronic kidney disease (CKD) is a progressive disorder associated with increased cardiovascular morbidity and mortality. Among the contributing factors to vascular dysfunction in CKD, visceral adipose tissue (VAT) has emerged as a key player due to the link between its pro-inflammatory, pro-fibrotic and pro-osteogenic microenvironment in CKD with both kidney and vascular damage. VAT secretes various adipokines and cytokines, including tumor necrosis factor-alpha (TNF- $\alpha$ ), interleukin-1 (IL-1), IL-6, and transforming growth factor  $\beta$  (TGF $\beta$ ), associated to oxidative stress, endothelial dysfunction, and arterial stiffness. Moreover, it secretes bone morphogenetic proteins (BMPs) which play a crucial role in vascular remodeling in CKD.

BMP-2, a driver of vascular calcification, is upregulated in VAT associated to inflammation and arterial stiffness. Conversely, BMP-7 exerts protective effects by inhibiting fibrosis and vascular calcification while promoting tissue repair and regeneration. The imbalance between BMP-2 and BMP-7 in CKD contributes to progressive vascular damage, highlighting the need for targeted therapeutic interventions. These effects are further exacerbated in individuals with diabetes, where insulin resistance and hyperglycemia enhance VAT dysfunction, worsening vascular injury and CKD progression. Finerenone, a novel selective nonsteroidal MR antagonist, has shown promising effects restoring the imbalance observed in CKD between the procalcifying BMP-2 and the nephroprotective BMP-7 in plasma, kidney, and VAT in associated with a reduction in inflammation and fibrosis independently from changes in glucose homeostasis.

#### **PROFESSIONAL INTERESTS:**

- Pathophysiological mechanisms in cardiovascular disease (CVD) aimed at evaluating new drugs and designing new intervention strategies to prevent and/or slow the progression of CVD,
- Role of perivascular adipose tissue on vascular function and arterial stiffness,
- With a translational perspective, to investigate and foster community pharmacist's intervention, delivered as a combination of health education, nutritional follow-up, and modification of lifestyle habits, to prevent and/or reduce CVD associated to CV risk factors.

#### **RELEVANT PUBLICATIONS:**

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