Association Between Serum Sclerostin Level And Carotid Artery Atherosclerosis In Hemodialysis Patients

Thesis

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Summary

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CKD is a public health crisis affecting about **10%** of the population worldwide with high morbidity and mortality.

Cardiovascular disease (**CVD**) is a leading cause of death especially in dialysis patients, accounting for more than **50%** of the causes of death in them.

There is growing evidence that there is "**non-traditional**" or "**novel**" risk factor unique to CKD such as disordered bone turnover (ROD), disordered mineral metabolism, and vascular or soft tissue calcification, which are interrelated and together form an entity called CKD-mineral and bone disorders (**CKD-MBD**).

Among the emerging pathogenicfactors involved CKD-MBD are **Wnt** signaling pathway and its inhibitors including **sclerostin**.

Sclerostin is a glycoprotein secreted by osteocytes and it inhibitsosteoblasts proliferation, differentiation, and promotes their apoptosis, via inhibition of **Wnt** signaling pathway, thus inhibits bone formation.

Recently,there is mounting evidence thatvascularcalcification is a process resembling osteogenesis that involves the phenotypic transformation of vascular smooth muscle cells (**VSMCs)** into bone-forming **osteoblast-like** cells; this is regulated by Wnt pathway and its inhibitors.

Atherosclerosis is one of themain forms of vascular calcification in CKD patients. Many studies demonstrated that Wnt pathway and its components are upregulated during all processes of atherogenesis.

Asymptomatic atherosclerosis can be detected by increased carotid intima-media thickness (**CIMT**) using carotid ultrasound.

Our study aimed to investigate the association between serum sclerostin level and carotid artery atherosclerosis in hemodialysis patients.

The study had enrolled **150** hemodialysis patients and **50** controls. Serum sclerostin concentrations were measured using a commercially available enzyme-linked immunosorbent assay (**ELISA**). CIMT was measured and carotid plaques were identified by carotid duplex.

Our results demonstrated that there was a statistically significant difference with p-value **<0.001** as regarding sclerostin levels between cases **(83.5±27.1 pmol/L)** and controls **(26.3±5.8 pmol/L)** with mean among cases **~3 times** higher than controls.

The **main finding** of our study is the statistically significant **positive** correlation with p-value **<0.001** between sclerostinlevels and each of **CIMT** (**r = 0.56**) and **CCA plaques size (r = 0.53)**.Sclerostin levels were higher in patients with increased CIMT (**77.6 ± 17.8 pmol/L**) than with normal CIMT (**70.9 ± 9.6 pmol/L**) and the highest mean was among patients with plaque formation (**109.3 ± 35.1 pmol/L**), the difference was statistically significant with p-value **<0.001**.

In conclusion, we can conclude that serum sclerostin is independently associated with carotid atherosclerosis (CIMT, plaques) in hemodialysis patients although more extensive studies are needed.