T15-027

Tohoku University's invention

Risk Marker for Diabetic Kidney Disease

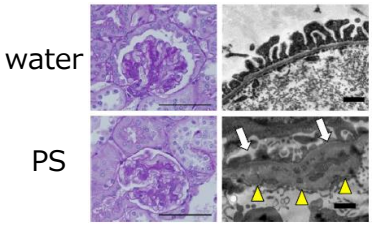
Phenyl Sulfate can be a predictor for a risk of developing Diabetic Kidney Disease

■Summary

Diabetic kidney disease(DKD) occurs in approximately 20-30% of all diabetic subjects. It is difficult to identify type 2 diabetes patients who are at risk of developing progressive DKD based only measurements of glomerular filtration rate (GFR) and albuminuria. In this study, from animal experiments and the U-CARE cohort study, inventors showed that phenyl sulfate(PS) could be a predictor and a risk factor for developing progressive DKD.

■Effect of PS on kidney tissue in db/db mice

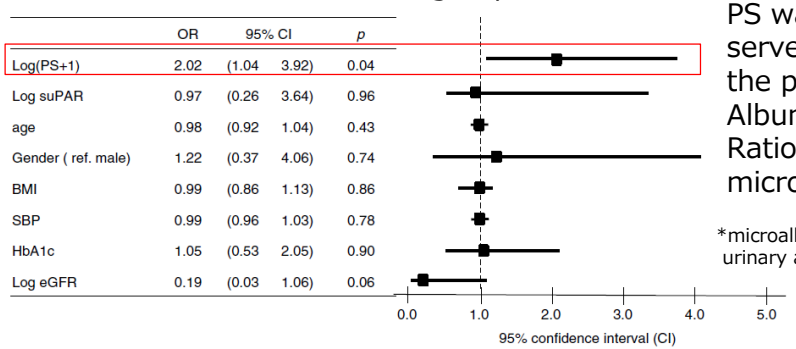
・Glomeruli in db/db mouse with or without PS for 6 weeks.



The foot processes effacement(white arrows) and the glomerular basement membrane thickening (GBM) (yellow arrow heads) were revealed in PS-treated db/db mice.

■Clinical significance of PS in DKD patients (U-CARE cohort study)

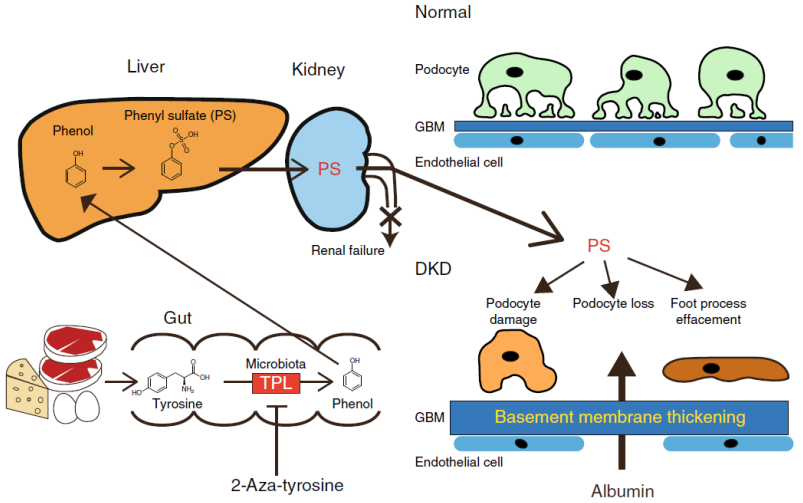
<Stratified logistic regression analysis based on the disease stage>
・a result of microalbuminuria group.



PS was the only factor that served as a predictor of the progression of 2-year Albumin to Creatinine Ratio(ACR) in patients with microalbuminuria(n=87).

*microalbuminuria
urinary albumin excretion:30-300mg/day

■A schematic model of the generation and toxicity of PS



In gut microbiota, TPL converts tyrosine to phenol and ammonia. The Phenol is absorbed into the body and the phenol is converted into PS in the liver. PS accumulation causes to damage podocytes, accelerate GBM thickening and induce proteinuria.

Ref. Nature Communication(2019)10:1835

Patent Information

WO Number : WO2017/564968
National Phase : JP, US, EP, CN, TW

Contact

Tohoku Techno Arch Co., Ltd.
TEL:+81-22-222-3049 FAX:+81-22-222-3419
Click here to contact