Department of Internal Medicine
Division of Nephrology and Hypertension

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General Summary
Our department is one of the largest nephrology departments in Japan and includes all subspecialties of nephrology, i.e., from early chronic kidney disease with proteinuria to dialysis and kidney transplantation. Therefore, our research groups are investigating diverse subjects and aim to eventually find new therapeutic strategies and mechanisms of disease progression, which may help decrease the number of patients with end-stage renal diseases.

Research Activities

Studies on immunoglobulin A nephropathy
We demonstrated that steroid pulse therapy with tonsillectomy had an independent effect on the disappearance of proteinuria (Nephrol Dial Transplant 2014). We also analyzed the prognostic factor that affects the recurrence of immunoglobulin A nephropathy after steroid pulse therapy (under revision).

Studies on low glomerular density in glomerular diseases
Our studies showed that low glomerular density was strongly associated with the prognosis of various glomerular diseases (Clin Kidney J 2014, Hypertens Res 2015, Am J Hypertens 2015). Collaborative research about the estimation of nephron numbers in Japanese patients is in progress.

Studies of hypertension and renal damage
We analyzed renal histopathological findings in relation to ambulatory blood pressure values. Only the severity of interstitial damage exhibited a significant association with an increased value of ambulatory blood pressure (Hypertens Res 2015).

Studies of chronic kidney disease-mineral and bone disease
In basic research, we evaluated the effects of chronic kidney disease on the transcription factor glial cells missing 2 (Gcm2), which is indispensable to parathyroid gland and epigenetic variations.
Also, we analyze functions of glial cells missing 1 (Gcm1), which is a homolog of Gcm2.
In a clinical study we clarified that ferric citrate hydrate, a novel iron-based phosphate binder, decreased concentrations of fibroblast growth factor 23. Because novel iron-based...
phosphate binders increase serum ferritin levels (CJASN 2014), we evaluate that there is no association between mortality and anemia related parameters included ferritin, hemoglobin, and transferrin saturation among patients undergoing dialysis with the registry date of the Japanese Society for Dialysis Therapy (NDT 2014).

*Studies of peritoneal dialysis*
We confirmed the availability of combined therapy with peritoneal dialysis and hemodialysis using outcomes of combined therapy in a cohort of more than 100 patients (Blood Purification 2014). Moreover, we found that survival outcome of combined therapy was not worse than that of peritoneal dialysis or hemodialysis (Blood Purification 2014). We are evaluating peritoneal injury using laparoscopy.

*Study of renal transplantation*
1. We investigated the significance of caveolin 1 immunoreactivities in peritubular capillaries in patients who have undergone the transplantation of kidney from living related donors. 2. We analyzed the effect of medullary ray injury early after kidney transplantation on the graft survival. 3. We examined the difference between ABO-compatible and ABO-incompatible kidney transplantation regarding cytomegalovirus infection.

*Renal protective effects of azilsartan in adenine-induced renal failure model rats*
We examined the mechanism of the renal protective effects of azilsartan in a rat model of renal failure. Daily urinary sodium excretion was decreased in the nonmedication group, and azilsartan suppressed the decreasing sodium excretion. Sympathetic nerve activity was elevated by azilsartan. Blood pressure was not elevated in this experimental model; therefore, because azilsartan greatly suppressed blood pressure, it did not suppress sympathetic nervous system, as previously reported.

*Central blood pressure and activity of the renin-angiotensin-aldosterone system*
We examined the relationship between central blood pressure (CBP) and the renin-angiotensin-aldosterone system in patients with primary aldosteronism and essential hypertension. The gap between central blood pressure (CBP) and brachial systolic blood pressure (SBP) increased with the plasma aldosterone concentration in essential hypertension. In primary aldosteronism, the CBP-SBP gap was significantly higher than that in essential hypertension. This study suggests that, even if SBP is well controlled, the kinetics of CBP indicate a different tendency from SBP as the renin-angiotensin-aldosterone system increases and might increase the risk of cardiovascular events.

**Publications**


