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Gender and renal diseases

Gender differences have been documented in the field of nephrology. Women seem to be somewhat protected from developing End Stage Renal Disease (ESRD). Gender differences exist with regard to the epidemiology, evolution and prognosis of chronic kidney disease (CKD). In some cases, these differences run contrary to the general population trends. The factors involved in this gender disparity may include diet, kidney and glomerular size, differences in glomerular hemodynamics, and the direct effects of sex hormones.

The progression rate of many renal diseases is affected by sex: in polycystic kidney disease, membranous nephropathy, immunoglobulin A nephropathy, and "chronic renal disease of unknown etiology," men progress at a faster rate to end-stage renal failure than do women. In Type 1 diabetes mellitus, there is evidence that males are more likely to manifest signs of renal disease, such as proteinuria.

In many, but not all, animal models of renal disease, estrogens slow progression rate in renal function decline. Animal and experimental studies have tried to offer further mechanistic explanations for gender differences in renal disease progression. Clinical observations in humans and studies in experimental animals in vivo and in models in vitro, have shown that renal structure and functions under various physiological, pharmacological, and toxicological conditions are different in M and F, and that these differences may be related to the sex-hormone regulated expression and action of transporters in the apical and basolateral membrane of nephron epithelial cells. As regard CKD progression, it has been suggested that the gender dimorphism in declining renal function may represent the effects of the interaction of circulating steroids with specific kidney receptors. Endogenous estrogens have in general been considered to have anti-fibrotic and anti-apoptotic effects on the kidney. On the other hand, the faster kidney function decline in men has been attributed to the specific proapoptotic and profibrotic properties of androgens. Hormonal manipulation by male or female castration also changes the course of renal disease progression, suggesting direct effects of sex hormones in influencing the course of these maladies. The true role of sex hormones in conditioning the CKD progression is not completely clear: most probably they don't have a direct causal role, but they act as permissive factors.

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