

한국인에서 사구체 여과율에 따른 혈청 TNF receptor 1과 2의 농도 변화

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Patterns of Serum TNF Receptors 1 and 2 According to the Glomerular Filtration Rate in Korean Population

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Background: Chronic inflammation is thought to be associated with the development of kidney disease. Tumor necrosis factor alpha (TNF α /TNF) is a key mediator of inflammation, and TNF signaling is mediated via two distinct receptors, TNFR 1 and TNFR 2. Elevated plasma levels of TNF receptors may contribute to the pathogenesis of renal decline. We investigated how circulating TNF markers varied according to glomerular filtration rate (GFR). Also we evaluated diagnostic power of TNF receptors compared to serum creatinine (SCr).

Methods: Study subjects were patients who participated in the study of Korean coefficients for GFR estimation by the MDRD study equations [CKD (n=201) and healthy volunteers (n=43)]. GFR was measured through systemic inulin clearance (a single injection method). And serum concentration of TNF receptors was measured by ELISA (DRT100 and DRT200; R&D Systems, Minneapolis, MN). We derived the reference values of TNF receptors according to GFR and evaluated diagnostic power of TNF receptors through ROC curve. We also compared the values of TNF receptors in patients with early renal decline (CKD stage 1 and 2) to healthy controls.

Results: Ln TNFR 1 as well as Ln TNFR 2 were significantly correlated with measured GFR ($r=-0.622$ and $r=-0.678$, respectively). Median values of TNFR 1 and TNFR 2 according to GFR were as follows: 765.45 and 1466.90 for GFR ≥ 90 [n=37 (15.2%)], 937.80 and 2143.89 for $90 > \text{GFR} \geq 60$ [n=66 (27.0%)], 1757.79 and 3410.06 for $60 > \text{GFR} \geq 30$ [n=89 (36.5%)], 3099.34 and 6993.72 for $30 > \text{GFR} \geq 15$ [n=42 (17.2%)], 2729.79 and 4876.16 for GFR < 15 [n=9 (3.7%)]. And TNF receptors had similar diagnostic power in patients with GFR less than 60 ml/min/1.73m² when compared to SCr through ROC curve. The levels of TNF receptors in the CKD stage 1 (n=43) and 2 (n=60) patients were higher than the levels in the healthy volunteers [1013.51 and 795.36 for TNFR 1 ($p=0.002$), 2108.93 and 1318.12 for TNFR 2 ($P < 0.001$)].

Conclusion: Our study identified that TNFR 1 and TNFR 2 were significantly correlated with measured GFR. And TNF receptors showed similar increment pattern and diagnostic power according to GFR when compared to SCr. Even mild renal impairment (CKD stage 1 and 2) was associated with higher levels of TNF receptors in comparison to healthy controls. Further studies are needed to establish the role of TNF receptors as a diagnostic and monitoring marker in patients with or without kidney disease.

Key Words: TNF receptor 1과 2, 사구체여과율

TNF receptor 1 and 2, Glomerular filtration rate