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Recombinant human-Erythropoietin (rH-EPO)과 N-acetylcysteine (NAC)의 방사선 조영제에 의한 신독성 예방효과에 관한 연구

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A Study Regarding the Prophylactic Effects of Recombinant Human-erythropoietin (rH-EPO) and N-acetylcysteine (NAC) in Radiocontrast Induced Nephropathy

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Purpose : The exact mechanism for radiocontrast induced nephropathy is not clear, it is thought to be due to the direct tubular toxicity and renal ischemic injury. Although open to dispute, prevention of radiocontrast induced nephropathy includes sufficient fluid administration before the exposure of contrast agents, fenoldopam, prostaglandin E1, NAC, hemodialysis and hemofiltration. EPO has been reported to prevent ischemia-reperfusion induced renal damage along with an anti-apoptotic effect. The authors have investigated the effects of EPO and NAC in the prevention and treatment of radiocontrast induced nephropathy in chronic renal disease patients, who are regarded as a high risk group.

Methods : Patients with a GFR of less than 60ml/min or a serum creatinine level of over 1.2 mg/dL and needed interventions including the use of radiocontrast materials(for example enhancement CT, coronary angiography or angioplasty) from August 2006 to March 2007 at the Chungnam National University Hospital were randomly divided into four groups, which were treated with EPO+NAC, EPO only, NAC only, and no treatment respectively. The serum creatinine, GFR, cystatin-C etc. were measured before, 24 hours and 48 hours after the intervention. The GFR was obtained using the Cockcroft-Gault equation.

Results : 55 patients (28 males and 27 females) participated in the study, with an average age of 69.67 years for the EPO+NAC group (12 males, 9 females), 71.88 years for the EPO group (4 males, 4 females), 67.1 for the NAC group (5 males, 5 females), and 67.4 years for the control group (7 males, 9 females). The average basal serum creatinine level was 2.34±0.84 (M±SD) for the EPO+NAC group, 2.38±1.10 for the EPO group, 1.90±0.79 for the NAC group, and 1.84±1.35 mg/dL for the control group. The change in serum creatinine levels for the basal level after 48 hours was −0.81±1.51 for the EPO+NAC group, −0.41±1.44 for the EPO group, −0.11±0.46 for the NAC group, and 0.39±0.95 mg/dL for the control group, showing an significant difference between the groups(p value <0.05).

Conclusion : The EPO+NAC group, the EPO group, and the NAC group all showed prophylactic effects for nephrotoxicity due to radiocontrast agents compared with the control group. Further studies with a larger patient group is needed to figure out whether the combined regimen is superior to EPO or NAC alone.