

### Contrast Nephrotoxicity Associated with Emergency CT scans

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**Purpose:** In the last 30 years, there has been a markedly increased use of iodinated contrast agents in diagnostic and interventional radiological procedures. Due to the possible side effect of nephrotoxicity of these radiocontrast agents, we investigated the incidence of nephrotoxicity and attempted to identify the patient groups at higher risk for contrast nephrotoxicity among the patients who underwent emergency computerized tomography.

**Methods:** We reviewed the medical records of 1,572 patients who had undergone contrast computerized tomography at the Emergency Center, Yonsei Medical Center, from January to May 2002. We defined contrast nephrotoxicity as any increase in the creatinine value of more than 0.5 mg/dL (44 μmol/L) or 25% compared to the baseline value..

**Results:** We found 21 patients (1.3%) who met the criterion for contrast nephrotoxicity: 13 patients with normal renal function, and 8 patients with a higher than normal creatinine value before contrast-enhanced computerized tomography. The incidence of contrast nephrotoxicity in the patient group with normal renal function was 0.8% (13/1551), compared to 38.1% (8/21) in the pre-existing renal insufficiency group. There were no statistical differences on the amounts of dye used and the frequencies of risk factors for contrast nephrotoxicity between the patients in pre-existing renal insufficiency group who developed nephrotoxicity and who did not. The renal function of all patients returned to the baseline value without dialysis or renal replacement therapy.

**Conclusion:** Pre-existing renal insufficiency is the most important risk factor for contrast nephrotoxicity. We need to take precautions and to have a proper protocol for the prevention of contrast nephrotoxicity in emergency care.

**Key Words:** Contrast nephrotoxicity, Contrast media, Renal failure

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Ultravist (iopromide), Iopamiro (iopamidol), Omnipaque (iohexol)  
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Table 1. Baseline characteristics of the study sample

	Contrast Nephrotoxicity Group (N=21)	Pre-existing Renal Insufficiency Group		p-Value
		Contrast Nephrotoxicity (+) (N=8)	Contrast Nephrotoxicity (-) (N=13)	
<b>Baseline Characteristics</b>				
Age in years	63.4±16.4	58.8±15.4	65.38±8.35	
Male: Female	13 : 8	5:3	11:2	
Age > 60 yrs	15 (71%)	5 (63%)	11 (85%)	NS
<b>Past History</b>				
Chronic renal failure	3 (14%)	2 (25%)	1 (8%)	NS
Diabetes	7 (33%)	4 (50%)	5 (38%)	NS
Hypertension	9 (42%)	2 (25%)	9 (69%)	NS
Liver cirrhosis	3 (14%)	2 (25%)	3 (23%)	NS
Congestive heart failure	0 (0%)	0 (0%)	2 (15%)	NS
Coronary artery occlusive disease	0 (0%)	0 (0%)	1 (8%)	NS
<b>Medications</b>				
ACE inhibitors	0 (0%)	0 (0%)	3 (23%)	
Calcium channel blockers	3 (14%)	2 (25%)	4 (31%)	
Diuretics	4 (19%)	2 (25%)	4 (31%)	
Beta-blockers	5 (24%)	1 (13%)	2 (15%)	
Insulin	2 (10%)	2 (25%)	2 (15%)	
Oral hypoglycemics	1 (5%)	0 (0%)	2 (15%)	
NSAIDS	3 (14%)	1 (13%)	0 (0%)	
<b>Baseline Lab Measures</b>				
Creatinine (mg/dl)	1.45±0.69	2.03±0.82	2.29±0.79	NS
BUN (mg/dl)	135.58±5.2	35.68±20.30	40.96±26.27	NS
BUN/Cr ratio	17.64±8.48	19.44±11.66	17.82±9.24	NS
Estimated CrCl (ml/min)	46.44±24.38	35.45±14.71	29.15±12.51	NS
Glucose (mg/dL)	186.28±118.78	196.5±95.13	213.38±276.81	NS
Hemoglobin (g/dL)	10.78±2.21	10.26±2.53	10.96±2.53	NS
Hematocrit (%)	31.78±5.86	30.14±6.01	32.68±8.56	NS
Urine specificity gravity	1.020±0.006	1.019±0.008	1.018±0.004	NS
<b>Creatinine Follow Up</b>				
After 24h	2.05±0.89	2.58±0.95	2.01±0.75	
After 48h	2.01±0.80	2.24±0.63	1.92±0.81	
After 72h	1.85±0.79	2.2±1.2	2.04±0.89	
After 96h	1.67±0.78	1.9±1.01	1.87±0.63	
Volume of Contrast Agent (cc)	128.57±25.35	125.00±26.73	112.30±28.32	NS
<b>Clinical Outcome</b>				
Good prognosis	21	8	13	
Dialysis	0	0	0	
Death	0	0	0	

2002 1 5 5 (enhancement) 24 ~ 72 1,572 0.5 mg/dL 25% Synchron LX20 Student t-test



1.2 mg/dL가 가 ( 1.5 mg/dL )  
 가 가 (osmolality)가  
 2.0 mg/dL 20% , 1.5 mg/dL  
 10% 9,14) 가  
 mg/dL 1.5 36% 21%  
 38.1% 0.8% 가  
 . 50% 16).  
 가 (nonoliguric) , 가  
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 . 1.8 mg/dL  
 가 24 60% , 72 Kg 5 mL /  
 90% 가 , 4~5 (mg/dL) 26%  
 , 7~10 2%  
 24 10  
 (47.6%), 48 17 (80.9%), 72 21  
 (100%) .  
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 , N-acetylcysteine, fenoldopam, atrial natri-  
 uretic peptide . Briguori 18)  
 N-acetylcysteine  
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 dopamine receptor agonist) fenoldopam dopamine  
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 , fenoldopam 19), Kini 20)  
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