PREVENTION OF CONTRAST-INDUCED ACUTE KIDNEY INJURY BY ORAL OR INTRAVENOUS HYDRATION: EVOLUTION OF MARKERS OF RENAL DAMAGE: NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN (NGAL) AND INTERLEUKIN-8 (IL-8)

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Introduction

- Contrast-induced acute kidney injury (CI-AKI) is the third most frequent aetiology of hospital-acquired AKI.
- There is evidence of a protective effect of hydration with intravenous administration of saline solutions but information about the efficacy of oral hydration is scarce.
- Because accumulation of creatinine is relatively slow, it requires 48 to 72 hours to identify many cases of CI-AKI. Neutrophil gelatinase-associated lipocalin (NGAL) and IL-8 could be early markers of AKI.
- **Objectives:** To study the change of urine and serum neutrophil gelatinase-associated lipocalin (NGAL) and IL-8 in patients who have received intravenous contrast media with different hydration protocols.

Patients and Methods

- A prospective, randomized, single-centre trial was performed in hospitalized non-diabetic patients with estimated glomerular filtration rate (eGFR) calculated by MDRD-4 higher than_30 ml/min, undergoing procedures with contrast media.
- Patients were randomized in three groups: G1: intravenous (IV) bicarbonate, G2: Oral hydration and G3: control. NGAL and IL-8 in serum and urine were studied before and after contrast administration.

Results

Between August 2008 and May 2012, 132 were included in the study. 57.7 years old (S.D:15.8), 82 males. There were no significant differences (p>0.05) between groups regarding their baseline characteristics (age, body mass index, blood pressure and NGAL and IL-8 level). However absolute change in serum and urine NGAL and IL-8 after contrast media administration was non-significant (p >0.05) across the 3 groups.

	G1 IV hydration n=44	G2 Oral hydration n=44	G3 Control n=44	p
Serum NGAL suero (ng/ml)				
Baseline	192.1 (187.7)	194.3 (173.1)	167.7 (106.78)	0.597
Change 4 h after	-0.5 (-17.5;17.5)	-5 (-58; 19)	13.5 (-19.5; 62.5)	0.062
Urine NGAL (ng/ml)				
Baseline	61.7 (110.7)	45.5 (73.7)	74.9 (207.1)	0.530
Change 4 h after	0 (-8.85; 25.75)	-1.25 (-10.35; 16.23)	-2.23 (-12.1; 4.25)	0.272
Corrected Urine NGAL (ng/ml)				
Baseline	156.8 (383.2)	161.5 (381.2)	146.0 (408.1)	0.982
Change 4 h after	2.26 (-17.97; 89.93)	14.67 (-9.32; 51)	2.07 (-8.87; 17.79)	0.483
Serum Il-8 (pg/mL)				
Baseline	141.1 (164.5)	83.8 (133.2)	121.9 (171.3)	0.225
Change 12 h after	0 (-21.35; 63.33)	0 (-10.87; 6.80)	-5.83 (-28.13; 7.90)	0.244
Urine Il-8 (pg/mL)				
Baseline	131.4 (318.4)	114.5 (255.3)	143.43 (432.6)	0.974
Change 12 h after	0 (-15.01; 2596)	0 (-34.55; 33.72)	0.0005 (-7.40; 30.19)	0.781
Corrected Urine Il-8 (pg/mL)				
Baseline	362.2 (1070)	409.2 (885.5)	382.3 (1300)	0.912
Change 12 h after	-74.9 (-225.9; 76.0)	-38.7 (-229.1; 151.8)	-46.7 (-219.3; 125.9)	0.951*

All values are reported as median (p25; p75) or *mean (95% confidence interval)
NGAL: neutrophil gelatinase-associated lipocalin

Conclusions

In patients with low risk of CI-AKI, different hydration protocols do not determine differences both in plasma and urine change of NGAL or IL-8 level.

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References: Haase M et al. *Am J Kidney Dis 2009;*54:1012-1024 and Kwon O et al. *Am J Kidney Dis 2003;*41:1074-1087