Contrast induced nephropathy in elective versus urgent non-diabetic patients

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Introduction: Contrast induced nephropathy (CIN) following invasive cardiovascular interventions (ICI) is associated with increased mortality and morbidity¹. Although, it occurs more frequently in high risk patients with renal failure (RF) and diabetes mellitus (DM), incidence up to 10% has been described in patients without DM². Some research suggest that urgent contrast requiring procedures elevate CIN incidence in overall population. Aim of this study was to compare CIN incidence in non-DM patients after ICI depending on the urgency of procedure.

Patients and Methods: We retrospectively observed all patients undergoing ICI requiring contrast in 2015. From 2756 patients, we included 323 non-diabetic patients who had serum creatinine level (SCL) measured before ICI and at least one time between 24 and 72 hours following ICI. CIN was defined using grading system in two stages; 1. SCL increase $\geq 25\%$ and $< 44 \mu\text{mol/L}$ above baseline and 2. SCL rise $> 44 \mu\text{mol/L}$ above baseline. Patients were stratified accordingly in 3 groups no-CIN, CIN-1 and CIN-2. Complexity of ICI was assessed using total procedure duration (PD), fluoroscopy time (FT) and contrast volume (CV).

Results: From total 323 patient (age 63.8 ± 15.3) 101 (31.3%) were female. Compared with men they were significantly older (69.1 ± 16.7 vs 61.5 ± 19.9 , $p < 0.001$) and had worse RF (eGFR - 64.85 ± 2.26 vs 79.62 ± 25.16 ml/min/1.73m², $p < 0.001$). Elective procedure was done in 39.95%. Average PD was 40.82 ± 38.2 min with 10.8min FT. During ICI 168.8 ± 113.4 ml of CV was used. Overall CIN incidence was 17.02% (N=55), from which 65.45% (N=36) was defined as stage 1. Between urgent and elective procedure there was no significant difference in CIN incidence ($p > 0.6$). Interestingly, elective patients had lower baseline eGFR (70.6 ± 25.9 vs. 78.6 ± 24.6 , $p = 0.006$). There was no significant difference in other previously mentioned observed parameters. After comparison of all data between groups, we found significant difference only in gender, with women having higher rate of CIN in all groups ($p < 0.05$). Also, between no-CIN and CIN-1 vs to CIN-2 group we observed lower baseline eGFR in CIN-2 ($p < 0.05$). The same diversity was observed within each gender.

Conclusion: Results of our study suggest high overall CIN incidence of 17%, with no difference considering urgency of procedure. All these results must be taken with caution due to potential selection bias in elective group. In our opinion, results here described, represent smaller, more morbid percentage of total elective patients (only 6.62% of totally screened elective patients were included). This might happened because elective ICI are usually one day procedures. Also, observation that CIN is commoner in female gender is probably influenced by confounding factor; older age and worse renal function in women. Just as previously described, our results suggest that low eGFR is important risk factor for CIN development, just as lower eGFR is connected with more severe stage of CIN.

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LITERATURE

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