

# **RenalGuard™ System for Prevention of Contrast-Induced Nephropathy: The Malta Experience**

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## **Background**

Contrast-induced nephropathy (CIN) is a common complication of invasive coronary angiography (ICA) in patients with chronic kidney disease (CKD). CIN accounts for approximately 10% of all causes of hospital acquired acute kidney injury. Hydration regimes for 24 hours prior to and 48 hours post ICA are the cornerstone of prophylaxis of CIN. The RenalGuard™ system delivers urine flow rate-guided hydration (UFGH). It has been shown to prevent CIN and is performed as a day case procedure. It was introduced in Malta in July 2020.

## **Purpose**

To assess the outcome of UFGH using the RenalGuard™ system in patients with moderate / severe CKD undergoing ICA in our centre.

## **Methods**

The data of all patients who underwent ICA while on the RenalGuard™ system from July 2020 to September 2021 was retrospectively collected using the hospital IT records iCM, CVIS and ECS. The patient demographics, time of procedure, and amount of contrast given was recorded. Serum creatinine, urea, eGFR, potassium, haematocrit, and haemoglobin prior to ICA, and on day 1 and 2 post ICA were collected. The CIN Mehran score, based on comorbidities and intra-procedure risk factors, was calculated. Risk of CIN is predicted to be low risk (7.5%) for scores  $\leq 5$ , medium risk (14%) for scores of 6–10, high risk (26.1%) for scores of 11–15, and very high risk (57.3%) for scores of  $\geq 16$ .

## **Results**

Fourteen patients, 11 males, aged 64 to 86, mean age 75 years, underwent ICA under cover of the RenalGuard™ system. All had moderate/severe CKD with an eGFR of less than 45 mL/min/1.73m<sup>2</sup>. The CIN Mehran score ranged from 8 to 20, mean 15. The CIN risk ranged from 14% to 57%, mean 36%. Nine of the patients proceeded to ad hoc percutaneous coronary intervention (PCI). The time of procedure ranged from 30 to 132 minutes, mean 122 minutes. One patient (7%) who also underwent ad hoc PCI suffered from CIN.

## **Conclusion**

Our result is comparable to the large REMEDIAL III trial which showed that patients with CKD undergoing ICA with UFGH sustained CIN at a rate of 4.3%. Furthermore, it showed a better outcome when compared to standard hydration. In a study by Sato et al, 8.7% of patients with CKD undergoing ICA treated with standard hydration suffered from CIN. The Malta experience shows that RenalGuard™ system protects CKD patients undergoing ICA from CIN with the important advantage of reducing hospitalization time.