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IM - COMMENTARY

Are we still wondering or wandering in the dark?

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Acute renal failure (ARF) or acute kidney injury (AKI), especially superimposed in a chronic renal failure patient can detrimentally and terminally unbalanced a hardly maintained physiologic function, determining the dialysis for that patient. Otherwise, the acute phenomenon, possibly self limited, can acutely affect a relatively healthy patient, as well as compromising the renal function [1].

It is not uncommon as well that the patients with chronic renal failure would also be the one requiring radiology or cardiology studies involving contrast.

Besides several measures have been taken, several strategies and protocols have been applied, the "evidences" are still uncertain. In the age of evidences and certainties, how could we possibly intervene with a clinical common sense?

Contrast-induced nephropathy (CIN) is reported to occur in as many as 14.5% of unselected patients undergoing coronary angiography/intervention [2], and is the third most common cause of in-hospital acute renal failure after hypotension and surgery [3]. Important risk factors for CIN include pre-existing renal dysfunction, especially that due to diabetic nephropathy, reduced circulating volume, the volume and type of contrast agent employed, and concomitant administration of potentially nephrotoxic drugs [4, 5]. Several agents have been proposed to provide prophylaxis against CIN [6]. However, until recently, only saline hydration (1 ml/kg 0.45% saline for 12 h pre- and post-contrast exposure has been confirmed to be effective) [5].

The precise mechanisms leading to CIN remain a matter of debate, although the root of the problem appears to be an injury to the renal medulla resulting from a combination of reduced blood flow, an osmotic effect, and direct tubular toxicity [7, 8]. The last of these may be a direct result of toxic free radical release, which occurs after contrast administration.

Acetylcysteine (NAC), an antioxidant, has been advocated for a while in addition to saline hydration in preventing CIN [9, 10], although this has not been a universal finding [11, 12]. Successful protocols tested to-date require the initiation of therapy on the day before contrast exposure, precluding the treatment of same-day and emergency patients.

However, different protocols and administration routes have been used, but systematic reviews failed to find a definitive answer whether the practice is effective to be justified. While the recommendations of using NAC and ascorbic acid are based on the proposed lack of evidenced efficacy that may be limited to the high risk population only. The management is clinically simple and could still present a benefit without any evident safety concern for the patients.

In the current study of Calabro et al. [13], investigators found a reduction in the incidence of CIN, confirming previous results of a high risk population [14] in the low risk patients (no diabetes, age <65 and no creatinine greater than 1.4 mg/dL).

Raw numbers for their studies are, respectively, 6.7% in the initial retrospective study, an with incidence of CIN of 4.4% in the treatment high risk group versus 9.8% in the non-treated low risk group, and 7.1% in the prospective observational study using a historical control, with an

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incidence of 2.6% in the low risks treated group versus 11.2% in the non-treated. Whether or not we can argue that the studies were not randomized, were not blinded and were not controlled, still the differences are clinically relevant.

Moreover, the main point remain the identification of risk factors that can easily being modified by preoperative or pre-procedural protocols involving suspension of diuretics, hypotensive drugs affecting renal perfusion and providing good hydration, underestimated probably by most clinicians. As shown by Baker [5], a rapid infusion protocol can still be applied wherever a missed preparation has occurred and could substitute the oral preparation.

Should we proceed with a treatment that is doubtful in its clinically efficacy? Well, we can at least assume it is safe and relatively inexpensive. Moreover, as Calabro points out, the reported incidence of CIN is still ranging between 2 and 50%, meaning a difficulty either to identify, or diagnose or stratify the patients at risk for it, and in consideration of different patients' response. Indeed, the injury seems to be unrelated to the severity of the chronic renal condition or the contrast used [1]. One paradigm could be to utilize new (because proposed as diagnostic tools) markers of injury and possibly more sensitive and specific tests, to support and identify earlier the renal injury or to anticipate the patient risk score based on those parameters [15].

The work by Calabro and associates is an interesting result and should not prompt any further doubt other then to continue and prophylactively intervene in the cath laboratory and any radiology suites protecting them from an impending and potential nephropathy, as well possibly utilize NAC in the operating room, considering large prospective randomized studies with better standardized and stratified patient cohorts.

Conflict of interest None.

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