

Does zinc possess renoprotective properties in patients under cardiac surgery?

Sir,

Acute kidney injury (AKI) is a serious and common postoperative complication of cardiac surgery (CS) with incidence and mortality rate. The most prominent pathologic mechanism of AKI following CS is acute tubular necrosis.^[1] The inflammatory responses, the production of free radicals, and tubular oxidative stress, which are triggered by CS, play an important role in the tubular necrosis.^[2] Hence, it seems that the modification of inflammatory responses and reduction of renal tubular oxidative stress become main therapeutic targets. No proven intervention has demonstrated a definitive renal protection during CS, so far. Some pharmacological agents have revealed protective benefits on renal function; however, the current evidence is controversial. Therefore, finding effective and promising interventions for preventing this complication remains a priority for future research.

Following stress and trauma such as CS, the induction of acute phase response, and production of proinflammatory cytokines redistribute micronutrients from the vascular compartment; consequently, the plasma concentration of micronutrients is declined.^[3] In these cases, evidence suggesting supplementation with antioxidant and anti-inflammatory micronutrients such as zinc can form antioxidant defense mechanisms, downregulate cytokine production, and decline cytokine concentrations and hence can reduce oxidant injury to cells and organs.^[3,4] Since several renal diseases are mediated by oxidant injury, decreasing the production of reactive oxygen molecules or treating with antioxidant agents may open new avenues for research into therapeutic intervention.^[5]

Zinc is capable of decreasing postischemic injury to different organs such as kidney. It can antagonize the transition of metal-catalyzed reactions and reduce the formation of hydroxyl radical from hydrogen peroxide.^[4] However, its effectiveness has not been tested in a trial regarding CS-associated AKI. Berger *et al.*^[3] found that antioxidant supplementation could significantly reduce the inflammatory responses in patients under CS.

Finally, zinc possesses an antioxidant and anti-inflammatory properties; it is safe, nontoxic, inexpensive, and widely

available antioxidant. Therefore, its effectiveness and efficacy should be evaluated in future trials to find answer to this question: Does zinc possess renoprotective properties in patients under cardiac surgery?

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Conflicts of interest

There are no conflicts of interest.

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