RE: Renal protective effect of *N*-acetylcysteine with stepwise ramping voltage against extracorporeal shock wave lithotripsy-induced renal injury: a prospective randomized trial from Desoky et al

Maria Chiara Sighinolfi¹ · Bernardo Rocco¹

Received: 2 August 2020 / Accepted: 13 August 2020 / Published online: 29 August 2020
© Springer Nature B.V. 2020

Editor,

We read with great interest the article from Desoky et al. [1]. Authors investigated the possible role of *N*-acetylcysteine (NAC) as a reno-protective agent in patients elected to ESWL. NAC is recognized as a potent scavenger of reactive oxygen species that improves endothelium-dependent vasodilation; as an antioxidant agent, in animal models NAC significantly reduces kidney damage. In the clinical practice, NAC is widely applied to prevent the toxic acute renal failure from contrast dye [2]; however, the optimal drug dose and route of administration still remain controversial.

The possible nephron-protective role of NAC has been successfully used by Desoky et al. [1] to prevent tissue alteration and injury following ESWL: in this setting, NAC administration before and after the treatment resulted in unimpaired levels of urinary proteins and enzymes representative of glomerular and tubular damage (albumin, NAG and NGAL), especially if accompanied by a stepwise ramping strategy of ESWL.

Interestingly, more than a decade ago, our group addressed the issue of kidney protection with the use of inosine injection before ESWL [3]; through an experimental study, we found an unimpaired NAG and LDH urinary concentrations after ESWL in rats previously treated with inosine. Unfortunately, at that time, the limited availability of inosine avoided further researches on application in the clinical practice. In such a view, Desoky and co-workers should be commended for the proposal of a simple, easy and widely available agent to enhance the safety of ESWL.

Actually, the absence of anesthesia and the minimal invasiveness [4, 5] makes ESWL an option suitable for different

kind of stone formers, including pediatrics [6] and elderly [7], and patients with special conditions such as solitary [8] or transplanted kidney [9]. In this view, the implementation of strategies—either technical or pharmacologic—to improve the protection of kidney tissue is advisable and worth of future researches.

References

1. Desoky EAE, Sakr AM, Alhefnawy M, Omran M, Abdalla MMH, Shahin AS, Ali MM (2020) Renal protective effect of *N*-acetylcysteine with stepwise ramping voltage against extracorporeal shock wave lithotripsy-induced renal injury: a prospective randomized trial. *Int Urol Nephrol*. <https://doi.org/10.1007/s11255-020-02580-1> [Online ahead of print]
2. Faggioni M, Mehran R (2016) Preventing contrast-induced renal failure: a guide. *Interv Cardiol* 11(2):98–104
3. De Stefani S, Micali S, De Carne C, Sighinolfi MC, Di Pietro C, Marzona L, Volpi N, Bianchi G (2008) Shockwave lithotripsy and protective role of inosine: early and late evaluation in an experimental model. *J Endourol* 22(5):1059–1063. <https://doi.org/10.1089/end.2006.0264>
4. Skolarikos A, Alivizatos G, de la Rosette (2006) Extracorporeal shock wave lithotripsy 25 years later: complications and their prevention. *Eur Urol* 50:981–990. <https://doi.org/10.1016/j.eururo.2006.01.045> (discussion 990)
5. Micali S, Sighinolfi MC, Grande M, Rivalta M, De Stefani S, Bianchi G (2009) Dornier lithotripter S 220 F EMSE: the first report of over 1000 treatments. *Urology* 74:1211–1214. <https://doi.org/10.1016/j.urology.2009.05.101>
6. Brad AB, Ferro M, Vartolomei MD, Tătaru S, Anton-Păduraru DT, Simion C, Martha O, Pricop C, Porreca A, Negru I (2019) Particularities and Efficacy of extracorporeal shock wave lithotripsy in children. *Urol Int* 103:318–325. <https://doi.org/10.1159/000502101>
7. Sighinolfi MC, Micali S, Grande M, Mofferdin A, De Stefani S (2008) Bianchi G Extracorporeal shock wave lithotripsy in an elderly population: how to prevent complications and make the treatment safe and effective. *J Endourol* 22:2223–2226. <https://doi.org/10.1089/end.2008.9704>
8. Pietropaolo A, Reeves T, Aboumarzouk O et al (2020) Endourologic management (PCNL, URS, SWL) of stones in solitary

✉ Maria Chiara Sighinolfi
sighinolfic@yahoo.com

¹ Department of Urology, University of Modena and Reggio Emilia, Via del Pozzo 71, 41100 Modena, Italy

- kidney: a systematic review from european association of urologists young academic urologists and uro-technology groups. *J Endourol* 34:7–17. <https://doi.org/10.1089/end.2019.0455>
9. Cicerello E, Merlo F, Mangano M (2014) Urolithiasis in renal transplantation: diagnosis and management. *Arch Ital Urol Androl* 86(4):257–260. <https://doi.org/10.4081/aiua.2014.4.257>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.