

Authors' reply

Dear Editor,

We would like to thank the authors for their comments and questions.

Cardiac dysrhythmias (CD) caused by extracorporeal shock wave lithotripsy (ESWL) are rarely observed; however, ungated ESWL has been found to be associated with CD.^[1] Although the underlying mechanisms of ESWL-induced CD are not fully understood, the proposed mechanisms include direct mechanical stimulation of the myocardium and/or a neurohumoral response to treatment, and neurohormonal activation with elevated epinephrine levels in response to ESWL.^[2,3] In a study investigating the effect of ESWL on enzymes and electrolytic levels in renal stone patients, Shakir et al. demonstrated significantly increased serum and urinary concentration of sodium, potassium, and chloride on the first post-ESWL day. They claimed that this finding was an indicator for tubular dysfunction due to cellular injury at energy levels of greater than 2000 shock waves at 20 kV.^[4] In an experimental study on biochemical alterations after exposure to ESWL, a transient decrease in the serum calcium level was observed, whereas sodium and potassium levels remained within normal limits.^[5]

In our study assessing electrocardiographic alterations in adult patients undergoing ESWL, clinical situations leading to electrolyte imbalance directly or indirectly, such as congestive heart failure or end-stage renal disease, were excluded. We also checked all admission laboratory parameters of participants before the procedure and none of our patients had abnormal parameters. Additionally, all patients underwent lithotripsy with a gradual incremental energy increase from 14 to 18 kV. As reported previously, low energy treatment (<20 kV) is associated with less cellular injury. For the aforementioned reasons, we did not perform a statistical analysis of serum electrolytes.

The study patients were classified as numbers and percentages when evaluated according to body mass index (BMI). No correlation was found between BMI and the admission electrocardiographic (ECG) pa-

rameters of the patients. An analysis of variance test also revealed no difference between the various BMI groups with respect to all ECG variables. Thus, it was concluded that ECG was not affected by possible changes due to obesity.

Gündüz Durmuş, M.D.,¹ Muhsin Kalyoncuoğlu, M.D.,¹ Mehmet Baran Karataş, M.D.,² Yiğit Çanga, M.D.,² Semi Öztürk, M.D.,¹ Ender Özal, M.D.,³ Yasin Çakıllı, M.D.,² Tuncay Kırış, M.D.,⁴ Barış Güngör, M.D.,² Ahmet Taha Alper, M.D.,² Mehmet Mustafa Can, M.D.,¹ Osman Bolca, M.D.²

¹Department of Cardiology, Haseki Training and Research Hospital, İstanbul, Turkey

²Department of Cardiology, Siyami Ersek Thoracic and Cardiovascular Surgery Training and Research Hospital, İstanbul, Turkey

³Department of Cardiology, Bağcılar Training and Research Hospital, İstanbul, Turkey

⁴Department of Cardiology, İzmir Katip Çelebi University Atatürk Training and Research Hospital, İzmir, Turkey

e-mail: mkalyoncuoglu80@gmail.com

Conflict-of-interest: None declared.

References

1. Skolarikos A, Alivizatos G, de la Rosette J. Extracorporeal shock wave lithotripsy 25 years later: complications and their prevention. *Eur Urol* 2006;50:981–90. [CrossRef]
2. Skinner TA, Norman RW. Variables influencing the likelihood of cardiac dysrhythmias during extracorporeal shock wave lithotripsy. *Can Urol Assoc J* 2012;6:107–10. [CrossRef]
3. Ishihara M, Ishidori N, Uchida H, Watanabe K, Kataoka T, Ogawa Y, et al. Relationship between plasma hormones and ventricular premature contractions in extracorporeal shock wave lithotripsy-significance of human atrial natriuretic peptide (hANP). *Hinyokika Kyo* 1999;45:169–73.
4. Shakir MA, Karira KA, Rani M, Shaikh H. Effect of Extracorporeal Shockwave Lithotripsy (ESWL) on Enzymatic and Electrolytic Levels in Renal Stone Patients. *Medical Channel* 2010;16:206–10.
5. Jaeger P, Constantinides C. Canine Kidneys: Changes in Blood and Urine Chemistry After Exposure to Extracorporeal Shock Waves. In: Lingeman JE, Newman DM, editors. *Shock Wave Lithotripsy II. Urinary and Biliary Lithotripsy*. New York: Springer; 1989. p. 7–10. [CrossRef]