LETTER TO THE EDITOR

P-Wave Changes in Hemodialysis Patients: Reply to Marano et al.

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To the Editor,

We would like to thank Marano et al. for their valuable comments.¹ In the light of the authors recommendation, we excluded six patients with atrial fibrillation, and reevaluated our data with regard to presence of the interatrial block (IAB) and P wave duration in these hemodialysis patients. Indeed, changes of plasma ionic concentrations and/or atrial volumes during the dialysis may lead to modifications of atrial electrophysiology, namely, a decrease of atrial conduction velocity and a decrease of atrial effective refractory period.^{2–4} Although an increase in P wave duration during hemodialysis session has been described as a sign of intra-atrial conduction slowing,^{4,5} we could not find any difference between the pre- and postdialysis P wave duration values (Table 1). Although similar conclusion was drawn by some authors,^{3,6,7} other authors have reported such an association in their studies.^{4,5,8} The explanation for these discordant findings is unclear; however, there are likely a number of reasons for this. The sample size in this study is a limiting factor, and the most probable explanation for this difference may be the much higher prevalence of comorbidities (diabetes mellitus, hypertension, congestive heart failure, and coronary heart disease) in their cohorts

due to the difference in the populations evaluated in different studies. Second, it is conceivable that differences in the methodology employed have influenced the results of different studies. Despite the volume of studies, P-wave indices reference ("normal") values have not been standardized.^{9,10} The P wave duration cutoffs of 110 or 120 ms have been proposed,^{11,12} but the large prevalence of hospitalized patients found to meet these criteria suggests a low specificity and poor screening utility.⁹ Configuring ECG software to include P wave durations in computer-generated ECG readings instead of *manual measurements* would be *more accurate* in IAB diagnosis. *Third*, it is important that clinicians be aware of the distinct forms of IAB and that there can be progression from one type of IAB to another. Solak et al. reported hemodialysis patients have mostly partial rather than advanced IAB.⁸ IAB can be transient and in certain clinical circumstances may be reversible, or it can transform into a higher degree block and can also manifest transiently.¹³ On the other hand, the impact of chronic hemodialysis on P-wave parameters in the long run was not investigated thoroughly. Finally, Szabó et al. reported that an increased P dispersion occurred at the end of dialysis only in patients with an atrial diameter larger than 45 mm measured by

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Table 1. Comparison of Electrocardiographic and Echocardiographic Parameters before and after Hemodialysis

	Before Hemodialysis (n = 56)	After Hemodialysis (n = 56)	P Value
<i>Electrocardiographic findings</i>			
P-wave duration in lead D2 (msec) [median(IQR)]	115 (24)	116 (23)	0.317
P-wave duration in lead D3 (msec) [median(IQR)]	99 (20)	99 (20)	0.206
P-wave duration in lead aVF (msec) [median(IQR)]	109 (18)	111 (18)	0.041
IAB			
None, n (%)	28 (50)	28 (50)	–
Partial, n (%)	23 (41)	23 (41)	–
Advanced, n (%)	5 (9)	5 (9)	–

IAB = interatrial block.

echocardiography, and remained stable in those with diameter smaller than 45 mm.⁵ In our study, median left atrial size was 3.9 cm; therefore this difference might also explain this controversy result. All these problems cited above in employing P wave duration in hemodialysis patients may explain the variable results in the literature, and further studies are required to better investigate the both short-term and long-term hemodialysis effects on atrial electrophysiology.

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