European **Rev**iew for **Med**ical and **Pharmacol**ogical **Sci**ences 2015; 19: 3991-3992

Author's Reply

Atrial electromechanical delay in myotonic dystrophy type 1 patients

Dear Editor,

We read with interest the letter of Yiginer et al[1] about our recent article titled "Paroxysmal atrial fibrillation in myotonic dystrophy type 1 patients: P wave duration and dispersion analysis". In our study we showed significantly increased P wave duration and dispersion in DM1 patients compared to age and sex-matched healthy controls and in DM1 patients subgroup with atrial fibrillation (AF) compared to DM1 patients without atrial arrhythmias. We are aware that the difficulty in defining P-wave onset and offset may restrict the accuracy and reproducibility of the manual measurements. However, we believe that scanning and digitizing electrocardiogram (ECG) signals from paper records in order to display them on a high-resolution computer screen is a feasible and accurate analysis method with acceptable intraobserver and interobserver errors (< 5% in our DM1 population), as previously demonstrated by Dilaveris et al[2].

The atrial electromechanical delay (AEMD) duration is the sum of impulse propagation from sinus node to the atria and atrial electromechanical coupling duration[3]. The AEMD measurement was obtained placing tissue Doppler (TDI) sample volume on lateral mitral annulus (named lateral PA), septal mitral annulus (septal PA) and right ventricular tricuspid annulus (RV PA). Time intervals from the onset of P-wave on surface-ECG to the beginning of A-wave (PA) representing atrial-electromechanical delay were obtained from lateral mitral annulus, septal mitral annulus and right ventricular (RV) tricuspid annulus and named as lateral PA, septal PA and RV PA respectively. The timing of mechanical activation of each reference point namely lateral mitral, septal mitral and RV tricuspid annuli depends on the distances of these points to sinus node; the RV tricuspid annulus and the lateral mitral annulus are respectively the earliest and the latest point to be activated by the impulse arising from sinus node. Therefore, it is hypothesized that the difference between any two reference points reflects the mechanical-delay between these two points. The difference between septal PA and RV PA was defined as intra-right atrial AEMD, the difference between lateral PA and septal PA was defined as intra-left atrial AEMD, and the difference between lateral PA and RV PA was defined as inter-atrial AEMD[4]. Previous studies evaluated the predictive role of intra-left atrial electromechanical delay for paroxysmal atrial fibrillation recurrence in some clinical conditions[5-7]. We have recently evaluated the AEMD in a DM1-population with normal cardiac function and its relationship to AF onset underwent a long period external loop recorder monitoring, performed every six months during a four years follow up[8]. Our results showed that intra-left-AEMD and inter-AEMD were found to be independent predictors of AF-onset in DM1 patients; in particular a cut off-value of 39.2 ms for intra-left-AEMD had a sensitivity of 90% and a specificity of 90% in identifying DM1-patients with AF-risk who need a careful cardiac monitoring. Considering the high supraventricular arrhythmias risk and its consequences, the early identification of DM1-patients at high risk for AF is of pivotal importance for the optimization of the clinical follow-up and medical therapy. Intra-left- and inter-AEMD represent non-invasive, inexpensive, useful and simple parameters to assess the AF-risk in DM1 patients.

Corresponding Author: Federica Di Meo, MD; e-mail: f_dimeo@hotmail.it

Conflict of Interest

The Authors declare that they have no conflict of interests.

References

1) Russo V, Di Meo F, Rago A, Papa AA, Molino A, Mosella M, Politano L, Russo MG, Nigro G. Paroxysmal atrial fibrillation in myotonic dystrophy type 1 patients: P wave duration and dispersion analysis. Eur Rev Med Pharmacol Sci 2015; 19: 1241-1248.
2) Dilaveris P, Batchvarov V, Gialafos J, Malik M. Comparison of different methods for manual P wave duration measurement in 12-lead electrocardiograms. Pacing Clin Electrophysiol 1999; 22: 1532-1538.
3) Merckx KL, De Vos CB, Palmans A, Habets J, Cheriex EC, Crijns HJ, Tieleman RG. Atrial activation time determined by transthoracic Doppler tissue imaging can be used as an estimate of thetotal duration of atrial electrical activation. J Am Soc Echocardiogr 2005; 18: 940-944
4) Deniz A, Sahiner L, Aytemir K, Kaya B, Kabakci G, Tokgozoglu L, Oto A. Tissue Doppler echocardiography can be a useful technique to evaluate atrial conduction time. Cardiol J 2012; 19: 487-493.
5) Calik AN, Özcan KS, Ça da M, Güngör B, Karaca G, Gürkan U, Yilmaz H, Bolca O. Electromechanical delay detected by tissue Doppler echocardiography is associated with the frequency of attacks in patients with lone atrial fibrillation. Cardiol J 2014; 21: 138-143.
6) van der Hulst AE, Roest AA, Holman ER, Vliegen HW, Hazekamp MG, Bax JJ, Blom NA, Delgado V. Relation of prolonged tissue doppler imaging-derived atrial conduction time to atrial arrhythmia in adult patients with congenital heart disease. Am J Cardiol 2012; 109: 1792-1766.
7) Russo V, Rago A, Di Meo F, Papa AA, Ciardiello C, Cristiano A, Calabrò R, Russo MG, Nigro G. Atrial septal aneurysms and supraventricular arrhythmias: the role of atrial electromechanical delay. Echocardiography 2015; 32: 1504-1514.
8) Russo V, Rago A, Ciardiello C, Russo MG, Calabrò P, Politano L, Nigro G. The role of atrial electromechanical delay in predicting atrial fibrillation in myotonic dystrophy type 1 patients. J Cardiovasc Electrophysiol 2015; Oct 13, doi: 10.1111/jce.12821. [Epub ahead of print].

V. Russo, F. Di Meo, A. Rago, G. Nigro

Chair of Cardiology, Second University of Naples, Naples, Italy
Monaldi Hospital, Naples, Italy