Possible Role of the Heart Rate for the ECG Amplitude according to the Brody Effect of Athletes and Controls

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Dear Sir,

In their interesting article Storstein et al. [1] found that there is an obvious relation between heart rate and ECG amplitudes. Apart from the anatomical configuration of the chest region, it may be advantageous to consider the current intra-cavitary blood mass of the heart.

Brody [2] stated that this factor exerts an important influence on the amplitudes of ECG derivations. Experimental occlusion of the inflow tract or the outflow tract was correlated with changes in the QRS vectors [3]. Simonson [4] reported that the reduction in R-wave amplitude (lead I) during moderate exercise on a treadmill

was more pronounced in a group of middle-aged men (48-58 years, n = 100) compared to young healthy men (18-28 years, n = 30) which was associated with a greater increase in heart rate.

During exercise, the sympathetic activity was postulated to be the primary factor for the reduction in blood mass and consequently for the decrease in the amplitudes according to the Brody effect [5]. On the other hand, this relation did not hold in case of coronary artery disease, ischemia or in postinfarct states [6-10]. During digitalis therapy, an increase in R-waves was observed [11], which could possibly be related to the negative chronotropic effects of these drugs. Therapy with tricyclic antidepressants, having tachycardia as a common side effect, also showed apparently a slight tendency to a reduction in the R-wave amplitude in addition to the known decrease in T-waves [12].

Many patients would profit from an improved and diversified ECG interpretation. The papers cited above support the view that the adjustment of the ECG amplitudes for heart rate should also be taken into consideration. As the authors have collected excellent data, it may be a favorable strategy for further analysis.

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