ORIGINAL ARTICLE

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Alternating myocardial sympathetic neural function of athlete's heart in professional cycle racers examined with iodine-123-MIBG myocardial scintigraphy

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Myocardial sympathetic neural function in professional athletes who had the long-term tremendous cardiac load has not been fully investigated by myocardial iodine-123-metaiodobenzylguanidine (MIBG) uptake in comparison with power spectral analysis (PSA) in electrocardiography. Eleven male professional cycle racers and age-matched 11 male healthy volunteers were enrolled in this study. The low frequency components in the power spectral density (LF), the high frequency components in the power spectral density (HF), the LF/HF ratio and mean R-R interval were derived from PSA and time-domain analysis of heart rate variability in electrocardiography. The mean heart-to-mediastinum uptake ratio (H/M ratio) of the MIBG uptake, in professional cycle racers was significantly lower than that in healthy volunteers ($p < 0.01$) and HF power in professional cycle racers was significantly higher than that in healthy volunteers ($p < 0.05$). In the group of professional cycle racers, the H/M ratio showed a significant correlation with the R-R interval, as indices of parasympathetic nerve activity ($r = 0.80$, $p < 0.01$), but not with the LF/HF ratio as an index of sympathetic nerve activity. These results may indicate that parasympathetic nerve activity has an effect on MIBG uptake in a cyclist's heart.

Key words: iodine-123-metaiodobenzylguanidine (MIBG), myocardial sympathetic neural function, power spectral analysis (PSA) of heart rate variability, athlete's heart