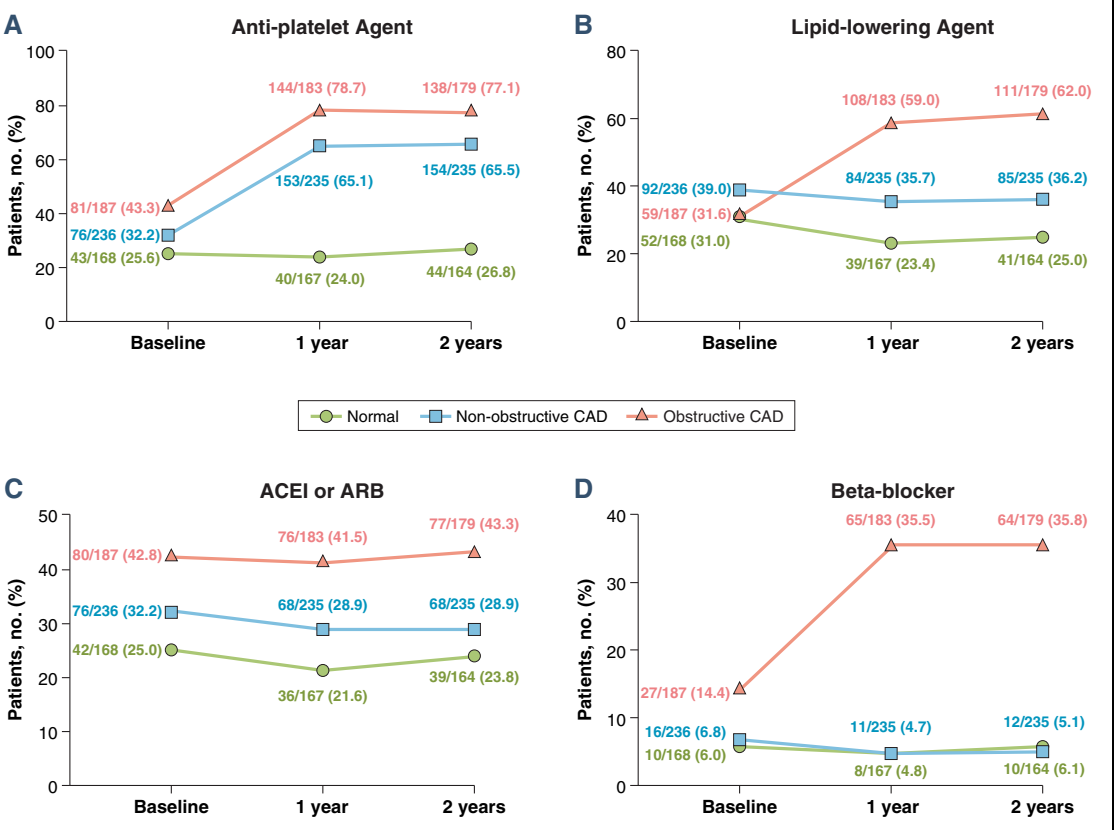
FIGURE 1 Medication Use Before and After Coronary CTA



Temporal trends in medication use according to severity of coronary artery disease (CAD) on coronary computed tomography angiography (CTA): **(A)** antiplatelet agent, **(B)** lipid-lowering agent, **(C)** angiotensin-converting-enzyme inhibitor (ACEI) or angiotensin receptor blocker (ARB), and **(D)** beta-blocker.

A major concern about coronary CTA use is exposure to radiation. However, recent advances in equipment and techniques have reduced radiation exposure to 0.21 mSv, equivalent to the dose of chest x-ray. In the near future, with further diagnostic accuracy, cost effectiveness, prognostic utility, and lower radiation risk, we think that coronary CTA would have a potential role in identifying asymptomatic type 2 diabetic patients with high risk.

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American-Style Football Players as Modern Gladiators: Could Heart Rate Provide All Answers?

We have read with a great interest a recently published study regarding blood pressure (BP) and left ventricular (LV) remodeling in American-style football players (1). The authors reported that players who are playing at a certain position (linemen) have significantly higher BP, increased prevalence

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of concentric LV hypertrophy, and reduced LV longitudinal strain compared with other players (nonlinemen) (1).

We believe that several points of this investigation deserve to be commented on and clarified. The interesting finding is that heart rate (HR) in linemen did not change during the season, whereas it significantly decreased in nonlinemen. Recently, Lo Iudice et al. (2) reported a strong negative association between HR and LV mechanics in top-level endurance athletes. This could partly explain the results of the current study and lower LV longitudinal strain in linemen. However, Lin et al. (1) showed that HR is not independently associated with LV longitudinal strain, although HR correlated both with LV longitudinal strain before and after the season. From a statistical point of view, the multivariate regression models used in the study have some limitations. First, it is not clear why Lin et al. (1) in the same statistical model included parameters with high collinearity such as systolic and diastolic BP; body mass index and body surface area; and LV mass, LV wall thickness, and LV relative wall thickness. This could be the reason why HR was not independently associated with LV longitudinal strain in the whole study population. Second, inclusion of 8 independent variables in one statistical model in a small study population like this might not be the best solution. Suggested changes of these statistical models possibly would result with other independent predictors of LV longitudinal strain in this population.

The other question that arises is why linemen have higher HR than nonlinemen do. In the previous paper of the same research group the difference in HR was even more obvious (3). Namely, HR in linemen was even higher after the season, whereas trend of HR reduction after season remained in nonlinemen (3).

The intrinsic heart rate mechanisms and vagal tone are predominant over sympathetic tone in professional athletes. However, linemen are exposed to high-volume endurance training during the season, but still have the same (1) or even higher HR (3) than other players do. Is their parasympathetic nervous system deprived or is their sympathetic nervous system excited more than in their teammates? Increased sympathetic activity is associated with elevated BP and increased LV mass as well as higher incidence of LV concentric hypertrophy (4). This might partly explain higher BP in linemen, higher increase in LV mass index in linemen, and higher incidence of concentric LV hypertrophy among linemen (1).

The Lin et al. (1) study opens many topics that remain to be resolved in future investigations. Probably the most important questions concern the cause of LV remodeling and hypertension in linemen players, the reversibility of these changes (complete or incomplete), and the influence of this adaptation on the outcome.

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THE AUTHORS REPLY:

We appreciate the interest of Dr. Tadic and colleagues in our work, specifically our recent paper documenting left ventricular (LV) mechanics among American-style football (ASF) players (1), and the chance to address their inquiries. First, the issue of heart rate and its impact on longitudinal strain has been raised. Specifically, it has been suggested that heart rate may be an explanatory mechanism underlying the observed reductions in LV longitudinal strain among ASF linemen. We are keenly aware of the inverse relationship between heart rate and LV strain, a phenomenon we observed among competitive rowers a decade ago (2). The heart rate-strain correlations in the study were driven exclusively by the nonlineman ASF athletes who engage in considerable isotonic training and experience expected reductions in heart rate. Thus, some of the LV strain increase noted in