

Aspirin Use to Reduce the Risk of Sports-Related Cardiac Arrest in High-Risk Athletes



To the Editor:

I respectfully wish to challenge the conclusion by Rao et al that the jury is still out on the potential adverse cardiovascular consequences of endurance exercise.^{1,2} The finding in a 10-year registry of US road races that marathon running is a significant risk factor for cardiac arrest in middle-aged males is the most robust evidence to date that vigorous exercise can trigger such events.^{3,4} Pre-mature cardiovascular morbidity and mortality, as also reported in US ironman triathletes,⁵ mandates an evidence-based response to address this paradoxical complication of endurance sports participation.

While proficient cardiac resuscitation during road races in Japan reduced fatalities following cardiac arrest,⁶ this accomplishment does not address coronary artery disease as the predominant underlying cause.⁷ Targeted screening with coronary artery calcium scores in endurance athletes is prudent based on a higher prevalence of coronary plaque volume in the presence of low conventional cardiac risk-factor profiles.⁸ Scores over 100 Agatston units, which independently identify a 10-year risk for incident cardiac events greater than 7.5%, justify additional measures for primary prevention by current guidelines.⁹ A validated risk calculator incorporating coronary artery calcium scores might enhance predictive accuracy among athletes with positive findings below that threshold.¹⁰

We have therefore proposed using aspirin for primary cardiovascular prevention for athletes identified at high risk by validated criteria, which intervention is evidence-based to reduce first acute myocardial infarctions by 44% in same-aged males in a prospective randomized controlled clinical trial.^{11,12} Aspirin may thereby mitigate the increasing frequency of exertional cardiac arrest in susceptible males during endurance

sporting events in the US since 2000, which agent has been shown to decrease short-term cardiovascular morbidity and mortality in women at high risk for preterm preeclampsia.¹³ Prerace medical screening and education has been validated to reduce life-threatening medical encounters during distance road races.¹⁴

Arthur J. Siegel, MD^{1,2,3}

¹Division of General Internal Medicine, Massachusetts General Hospital, Boston.

²Department of Internal Medicine, McLean Hospital Belmont, Mass.

³Harvard Medical School Boston, Mass.

<https://doi.org/10.1016/j.amjmed.2018.11.042>

References

- Rao P, Hutter AM, Baggish AL. The limits of cardiac performance: Can too much exercise damage the heart? *Am J Med.* 2018;131:1279–1284.
- Eijsvogels TMH, Fernandez AB, Thompson PD. Are there deleterious cardiac effects of acute and chronic endurance exercise? *Physiol Rev.* 2018;96:99–125.
- Albert CM, Mittleman MA, Chae CU, Lee I-M, Hennekens CH, Manson JE. Triggering of sudden death from cardiac causes by vigorous exercise. *N Engl J Med.* 2000;343:1355–1366.
- Kim JH, Malhotra R, Chiampas G, et al. Race-Associated Cardiac Arrest Event Registry (RACER) Study Group. Cardiac arrest during long-distance running races. *N Engl J Med.* 2012;366(2):130–140.
- Harris KM, Creswell LL, Haas TS, Thomas T, Tung M, Isaacson BS, et al. Death and cardiac arrest in U.S. triathlon participants, 1980 to 2016: a case series. *Ann Int Med.* 2017;167(8):529–535.
- Kinoshi T, Tanaka S, Sagisaka R, et al. Mobile automated external defibrillator response system during road races. *N Engl J Med.* 2018;379(5):488–489.
- Karam N, Petchmajou L, Dumas F, et al. Comprehensive assessment of coronary artery disease and sports-related sudden cardiac arrest. *Circulation.* 2018 [May 02, pii: CIRCULATIONAHA/118.034664].
- Merghani A, Maestrini V, Rosmini S, et al. Prevalence of subclinical coronary artery disease in Masters endurance athletes with low atherosclerotic risk profiles. *Circulation.* 2017;136:126–137.
- Budoff MJ, Young R, Burke G, et al. Ten-year association of coronary artery calcium with atherosclerotic cardiovascular disease (ASCVD) events: The multi-ethnic study of atherosclerosis (MESA). *Eur Heart J.* 2018. <https://doi.org/10.1093/eurheartj/ehy217>.
- Khera A, Budoff MJ, O'Donnell CJ, et al. Astronaut cardiovascular health and risk modification (Astro-CHARM) coronary atherosclerotic cardiovascular disease risk calculator. *Circulation.* 2018;138(17):1819–1827.

Conflicts of interest: none

Funding: none

Correspondence: McLean Hospital, 115 Mill Street, Belmont, MA 02478-1064, Tel: 617.855.2358, Fax: 617.855.3731

E-mail address: asiegel@partners.org

11. Siegel AJ, Noakes TD. Aspirin to prevent sudden cardiac death in athletes with high coronary artery calcium scores. *Am J Med.* 2018;000:1–4.
12. Steering Committee of the Physicians' Health Study Research Group. Final report on the aspirin component of the ongoing Physicians' Health Study. *N Engl J Med.* 1989;321(3):129–135.
13. Rolnik DL, Wright D, Poon LC, et al. Aspirin versus placebo in pregnancies at high risk for preterm preeclampsia. *N Engl J Med.* 2017;377(7):613–622.
14. Schwellnus M, Swanevelder S, Derman W, Borjesson M, Schwabe K, Jordaan E. Prerace medical screening and education reduce medical encounters in distance road races: SAFER VIII Study in 153, 208 race starters. *Br J Sports Med.* 2018;0:1–7.