Can pre-race aspirin prevent sudden cardiac death during marathons?

Arthur J Siegel,1,2 Timothy D Noakes3

As if reprising the index case of Pheidippides in 490 BC, the sudden cardiac death of a 32-year-old modern-day warrior at mile 20 in the 2016 London marathon mandates an expedited search to prevent such tragic events based on novel insights into the underlying cause (figure 1).1 2 Although the cardiac findings in this case have not been released, an acute coronary event is most likely as the most common cause of sudden cardiac death in men over the age of 30 years including among experienced runners in that event.3–5

While the overall incidence of sudden cardiac death during marathons is low, cardiac arrests occur in roughly 1 in 50,000 finishers.6 Based on 59 cases with a mean age of 42 years in a 10-year prospective registry of American road races since 2000, male sex and the marathon were the only significant risk factors for cardiac arrest.7 Atherosclerotic heart disease was the predominant underlying cause in same-aged runners in a concurrent Parisian registry.8 Marathon running thereby illustrates the triggering of acute myocardial infarction by strenuous exercise in middle-aged males with underlying non-obstructive coronary atherosclerosis.9

RATIONALE FOR TARGETED PREVENTION

Supported by a 44% reduction in first acute myocardial infarctions in healthy middle-aged men in the Physicians Health Study, a randomised controlled primary prevention trial,10 the International Marathon Medical Directors Association (IMMDA) has recommended prerace aspirin for males over the age of 40 years with approval by
Editorial

### Rationale for using prerace aspirin to prevent sudden cardiac death during marathons

- **Aspirin reduces first acute myocardial infarctions in healthy males by 44%**.
- **Acute myocardial infarction is the most common cause of sudden cardiac death in males over the age of 30 including during marathons**.
- **Use of prerace low-dose aspirin is prudent to prevent race-related sudden cardiac death**.

### The case for using prerace aspirin in middle-aged males

Given 285,040 US male marathoners over the age of 40 in 2015, IMMMDA's advisory warrants expedited attention given a greater than twofold increase in race-related cardiac arrests since 2005. We therefore encourage medical directors to follow Rio de Janeiro's lead by informing entrants of IMMMDA's advisory, hoping to avert cardiac arrests as occurred at their last two races (personal communication, Paulo Alfonso Loriegia de Menezes, MD, medical director, Rio de Janeiro marathon).

Prerace aspirin provides runners pre-emptively with the only pharmacological agent with a class 1A recommendation for pre-hospital administration in the event of an acute coronary syndrome. Such usage may reduce the increasing frequency of emergent post-race percutaneous coronary angioplasties and bypass surgery, as occurred after the most recent Boston and Chicago marathons. ‘Just because the cardiac risk is low, doesn’t mean it can’t be lower’, argues Amby Burfoot, Runners World’s editor-at-large and former Boston marathon champion.

IMMMDA’s advisory enables middle-aged males to make more informed decisions regarding the cardiovascular benefits of marathon training and pre-race aspirin use for risk reduction during races (figure 2). The lifetime benefit of reducing risk for sudden cardiac death through marathon training can be accomplished with attenuation of its transient risk during races (box 1). In lieu of a randomised controlled primary prevention trial in marathoners, which lacks feasibility due to the low frequency of index events, prospective registries can be used to assess aspirin’s efficacy once usage gains acceptance among runners contingent on wider support by the marathon medical community.

The goal of reducing sudden cardiac death in middle-aged males during marathons is realistic in our view, having successfully curtailed race-related fatalities due to water intoxication in young females through a robust consensus process. As it is safe, inexpensive and readily available worldwide, aspirin is ready for prime time in middle-aged males as a high-risk subgroup. Based on a predominance of current clinical evidence, this remedy, known to Hippocrates in the time of Phedippides, may enhance the heroic dimensions of a sport celebrating his legacy by reducing re-enactments of his tragic demise.

### Competing interests
None declared.

### Provenance and peer review
Not commissioned; externally peer reviewed.

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**Figure 1** Modern and ancient warriors.

**Figure 2** Father Time running a marathon, by Peter de Seve, The New Yorker, 13 November 1995.

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**Box 1** Rationale for using prerace aspirin to prevent sudden cardiac death during marathons

- Aspirin reduces first acute myocardial infarctions in healthy males by 44%.
- Acute myocardial infarction is the most common cause of sudden cardiac death in males over the age of 30 including during marathons.
- Use of prerace low-dose aspirin is prudent to prevent race-related sudden cardiac death.

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