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Commentary

Aspirin Use for Enhanced Primary Cardiovascular Prevention during the Coronavirus-19 Pandemic

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The 2019 American Heart Association/American College of Cardiology guidelines for the primary prevention of atherosclerotic cardiovascular disease virtually preclude aspirin use for adults ages 40-70 unless at long-term high risk (>10% threshold by 10-year risk calculators) [1]. The cardiovascular complications of coronavirus-19 (COVID-19) infection may require us to reconsider this, however, to take short-term high risk into account. Likened to a cytokine tsunami, elevated levels of interleukin-6 and C-reactive protein predict cardiac and respiratory failure, indicating that inflammation mediates excess morbidity and mortality [2-4]. While dipyridamole has been associated with clinical improvement which was not observed with angiotensin-converting enzyme inhibitors and angiotensin receptor blockers [5,6], the effect of aspirin on clinical outcomes has yet to be reported. Based on evidence that inhibition of inflammation prevents cardiovascular events and that low-dose aspirin conclusively reduced first heart attacks in middle-aged men in the randomized controlled Physicians Health Study [7,8], this latter approach has been recommended to protect athletes from the increased risk of event-related cardiac arrest and sudden death triggered by inflammation due to exertional rhabdomyolysis [9-11]. Aspirin's anti-inflammatory and anti-thrombotic effects may mitigate pandemic-related increased short-term risk, perhaps blunting the surge in coronary heart disease deaths which have occurred under such conditions [12]. C-reactive protein levels can reliably stratify risk for low-dose aspirin as have coronary artery calcium scores for statin therapy [13,14] (Table 1).

Prophylactic low-dose aspirin use for susceptible individuals presents a window of opportunity to reduce the cardiovascular complications of COVID-19 infection ahead of the second wave anticipated by the United States Center for Disease Control [15]. Based on inflammation as the root cause of atherothrombosis, a predominance of current clinical evidence supports this intervention without a randomized controlled clinical trial as necessary for novel interventions such as the high-dose interleukin-1 receptor antagonist tocilizumab [16]. Revised guidelines for primary prevention to accommodate short-term high risk may facilitate this goal as accomplished by subspecialty societies for treating acute myocardial infarction [17]. Preventing fatal strokes in young persons might be an unintended collateral benefit [18].

Keywords: *Aspirin, Coronary heart disease, COVID-19 pandemic, Primary cardiovascular prevention*

Table 1: Impact on Therapeutic Decision Making for Aspirin Use by Including Coronary Artery Calcium Scores and C-Reactive Protein Levels in Risk Calculations.

Proposed Guideline Using 10-year ASCVD Risk Estimate, CAC Score, and hs-CRP to Guide Aspirin Therapy				
Patient's 10-year ASCVD risk estimate:	<5%	5%-7.5%	>7.5%-20%	>20%
Consulting ASCVD risk estimate alone:	Aspirin not recommended	Consider aspirin	Recommend aspirin	Recommend aspirin
Consulting ASCVD risk estimate - CAC				
If CAC score = 0	Aspirin not recommended	Consider aspirin	Recommend aspirin	Recommend aspirin
If CAC score >0	Consider aspirin	Consider aspirin	Recommend aspirin	Recommend aspirin
If elevated hs-CRP:	Recommend aspirin	Recommend aspirin	Recommend aspirin	Recommend aspirin
Does hs-CRP modify treatment plan?	Yes	Yes	No	No

Green = yes; red = no; yellow = consider.
ASCVD = atherosclerotic cardiovascular disease; CAC = Coronary Artery Calcium; hs-CRP = high-sensitivity C-reactive protein.

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