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Prevention of Inflammation-Induced Endothelial Dysfunction. A Novel Vasculo-Protective Action of Aspirin

Circulation published May 13, 2002, doi:10.1161/01.CIR.0000017863.52347.6C

Abstract 1 of 1 ➤

Submitted on January 16, 2002

Revised on March 27, 2002

Accepted on March 27, 2002

Prevention of Inflammation-Induced Endothelial Dysfunction. A Novel Vasculo-Protective Action of Aspirin

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Background—Inflammation and infection may initiate and promote atherosclerosis or its complications by adverse effects on the vascular endothelium. The mechanisms by which aspirin reduces cardiovascular risk might involve anti-inflammatory actions or direct effects on the endothelium in addition to its antiplatelet action. We investigated the role of aspirin in modulating endothelial dysfunction induced by an experimental inflammatory stimulus.

Methods and Results—An inflammatory response was generated in healthy volunteers by Salmonella typhi vaccination. Venous occlusion plethysmography was used to assess resistance vessel responses (16 hours before and 8 hours after vaccination) to the endothelium-dependent dilator bradykinin (BK) and the endothelium-independent dilator glyceryl-trinitrate (GTN). Twelve subjects were randomized to receive either aspirin 1.2 g orally or placebo 2 hours before vaccination. After vaccination alone there was suppression of the response to BK in the placebo group ($P=0.01$), with no change in response to GTN. In the aspirin group there was no change in the response to either BK or GTN after vaccination.

Aspirin treatment prevented vaccine-induced elevation of interleukin-1 receptor antagonist but enhanced the generation of tumor necrosis factor- α compared with placebo. In an additional 5 individuals, local intrabrachial aspirin (10 mg/min for 15 minutes) failed to restore responses to BK after vaccination.

Conclusions—Experimental inflammation produces endothelial dysfunction, which can be prevented by pretreatment with aspirin. Locally administered aspirin does not reverse vaccine-induced endothelial dysfunction once established. The protective effects of aspirin on inflammation-induced endothelial dysfunction may be through modulation of the cytokine cascade.

Key words: arteries • aspirin • bradykinin • endothelium • inflammation

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