



PIC QUESTION OF THE WEEK: 02/18/08

Q: What is the significance of the term *aspirin resistance*?

A: Aspirin is often used in high risk cardiovascular patients to prevent the occurrence of atherothrombotic events such as stroke, myocardial infarction, and angina. Some data suggests that the effectiveness of aspirin varies greatly among patients with these conditions. This has stimulated discussion regarding possible *resistance* to the anti-platelet effects of aspirin in some individuals. *Aspirin resistance* is currently described as the failure of aspirin to produce expected pharmacologic effects including inhibition of platelet aggregation and suppression of thromboxane A₂ (TXA₂) production. Failure of aspirin to affect these parameters could result in subsequent cardiovascular complications. There is neither a standard definition nor recognized test to identify *aspirin resistance*. Its prevalence is suggested to range from 5% to 45% of the population; however, this estimate may be excessive. The mechanism for suggested *aspirin resistance* is not fully understood, but may be the result of alternative pathways of platelet aggregation, genetic polymorphisms, drug-drug interaction, or simply poor compliance. Few tests are available to determine a patient's degree of *aspirin resistance*. Current tests are not standardized and do not actually measure aspirin's direct anti-platelet effects. They measure the extent of platelet aggregation through optical platelet or whole-blood aggregometry or platelet aggregate ratio. A platelet function analyzer (PFA-100) measures platelet adhesion and aggregation and provides results in what is known as *closure time*. This value could be used to imply *aspirin resistance*. Urine tests can identify the amount of 11-dehydro thromboxane B₂ (the urinary metabolite of TXA₂). TXA₂ suppression during aspirin therapy is one reason for the drug's inhibitory effect on platelet aggregation. By measuring TXB₂ levels in urine, a relative anti-platelet effect of aspirin can be determined. *AspirinCheck* and *AspirinWorks* are two tests capable of measuring the amount of 11-dehydro TXB₂ in urine. Today, there are no specific recommendations for screening patients for *aspirin resistance* and no management guidelines if *resistance* is even suspected. Patients who have occurrence of thrombotic events while using aspirin prophylaxis may require an increase in dosage or addition of other anti-platelet agents such as clopidogrel. A just published systematic review of studies related to *aspirin resistance* concluded that overall frequency approaches 30% and that use of additional anti-platelet agents provided little benefit. The authors also recommended that the term *aspirin resistance* be abandoned and substituted with the term *aspirin non-responsiveness*.

References:

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