

Advances in Understanding “High on-Treatment Platelet Reactivity”

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There have been many publications in *Thrombosis and Haemostasis* in the past two years on the assessment of platelet function in individuals on anti-platelet therapy (1–36). These studies clearly illustrate the diversity in methods used to assess platelet function, and that the level of interest in measuring platelet function on drug therapy remains high.

Anti-platelet therapy is recommended for atherosclerotic disease management, and there is a growing interest in using platelet function tests to predict which individuals on therapy will suffer from major adverse cardiovascular events (9, 37, 38). Indeed, many laboratories currently assess platelet function in subjects on anti-platelet therapy (39). However, information is lacking on the diagnostic utility of platelet assays in drug therapy monitoring and testing is currently not recommended outside of clinical studies (40, 41). There are several reasons why it is important to identify clinical and laboratory predictors of high on-treatment platelet reactivity measured by different assays. First, knowledge of these predictors is essential to a proper interpretation of platelet function test findings for individuals on anti-platelet therapy. Second, identifying the predictors for different assays would help explain the poor correlation between assays in defining high on-treatment platelet reactivity. Third, these predictors may be useful to generate new hypotheses on the mechanisms of high on-treatment platelet reactivity.

In the October issue of *Thrombosis and Haemostasis*, Elsenberg et al. report on their study of the clinical characteristics, laboratory and inflammatory markers associated with high on-treat-

ment platelet reactivity for a number of commonly performed assays of platelet function (42). Significant merits of this study include: its prospective design; assessment of large number of subjects; and its use of standardised methodology, and rigorous criteria, for assessing a large number of clinical and laboratory variables for associations with high on treatment reactivity. The major finding of the study is that unique sets of clinical and laboratory variables are predictive of high on-treatment platelet reactivity measured by different platelet function assays. While many of the identified significant associations were only modestly predictive of high on-treatment platelet reactivity, the new information on predictors will be of great value to clinical and research laboratories.

In the future, it will be important to identify which of the many clinical and laboratory predictors of high on-treatment platelet reactivity has clinical utility for the assessment of individuals at risk for major, adverse cardiovascular events, and determine if using this information to change therapy improves clinical outcomes. It is possible that monitoring platelet function on drug therapy will not be required if the efficacy and safety profile of anti-platelet therapy improves and leads to changes in clinical practices. Such improvements could come from more widespread use of newer and more potent drugs, such as prasugrel, that show more predictable effects on platelet function than clopidogrel and less dependence on inherited differences in drug responsiveness. It will be important to report and translate the rapidly emerging knowledge in this field into clinical practice.

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