Preoperative screening: the rationale of measuring APTT in risk assessment

Although extensive preoperative laboratory testing is not recommended, the measurement of activated partial thromboplastin time might be profitably applied to selected categories of patients, especially those presenting with an unreliable history and physical examination, when considering history either prophylaxis or for avoiding improper exposures to allogeneic blood components.

Routine preoperative laboratory testing might be profitable for some reasons, including the identification of conditions at higher risk of bleeding, perhaps unrecognized by history or physical examination, or the achievement of baseline values useful in decision making during or following surgery.[1] Although wide coagulation testing is not recommended, the measurement of activated partial thromboplastin time (APTT) might be of clinical usefulness, especially in selected categories of patients.[2,3] Although a prolonged APTT may underlie potentially life-threatening abnormalities, other conditions might cause abnormal values, such as clinically insignificant deficiencies of coagulation factors, lupus anticoagulant (LAC) and heparin therapy. Additionally, APTT reagents differ widely in terms of sensitivity and responsiveness to deficiencies of clotting factors, LAC and heparin.[4] Therefore, the critical question is whether APTT should be measured as part of the risk assessment before surgery. To answer to this question, samples with isolated APTT prolongations were systematically investigated for the cause. APTT measurements were performed on a Behring Coagulation System (BCS, Dade Behring, Marburg, Germany), employing Pathromptin SL (micronized silica + calcium chloride solution, Dade Behring). The activity of coagulation factors VIII, IX, XI and XII was determined as one stage clotting assays with relative deficient plasma on Behring Coagulation Timer (BCT, Dade Behring) and using proprietary reagents. von Willebrand factor antigen (VWF:Ag) was measured by automated ELISA (BioMeriuex, Marcy L'Etoile, France) and von Willebrand factor ristocetin cofactor activity (VWF:RiCof) was assayed on BCT. The presence of LAC was investigated by PTT-LA¨ (Diagnostica Stago, Asnieres, France) and DRVVT (American Diagnostica Inc., Greenwich, UK). Heparin contamination was ruled out by thrombin time (BC-Thrombin reagent, Dade Behring). Values of coagulation factors were considered abnormal or life-threatening when falling respectively below their relative normal reference ranges or below the minimum amount of factor required for hemostasis.[5]

Table 1. Causes of isolated APTT prolongations identified during preoperative laboratory testing in 61 asymptomatic patients with negative clinical history for bleeding.

Coagulation abnormalities	*n*	*%*
Isolated factor XII deficiency	21	34.4
Combined factors deficiencies	17	27.9
Lupus anticoagulant	8	13.1
Isolated factor XI deficiency	7	11.5
Isolated VWF deficiency	5	8.2
Isolated factor IX deficiency	2	3.3
Isolated factor VIII deficiency	1	1.6

The main results of our investigation are summarized in Table 1. Of the 743 patients analyzed, sixty-one (8.2%) showed isolated prolongations of APTT. Three abnormalities (4.9%) fell within high-risk conditions for surgery: factor VIII deficiency (28 IU/dL), factor XI deficiency (18 IU/dL) and type I von Willebrand disease (VWF:Ag 42 IU/dL; VWF:RiCof 46 IU/dL). Our results indicate the clinical usefulness of including a sensitive APTT measurement in the preoperative risk assessment. There are some reasons to justify such a recommendation. Firstly, the three life-threatening abnormalities were identified in asymptomatic patients, lacking a clinical history indicative of bleeding. Due to the adoption of an adequate anti-hemorragic prophylaxis with desmopressin,[6] none of those patients experienced clinically relevant bleeding. Although the preoperative bleeding tendency is hardly predictable, some cases of serious hemorrhages have been described in patients carrying similar abnormalities.[5,7] Thus, we believe that the identification of the underlying cause of a prolonged APTT might be profitable in the clinical management of the patient. Particularly, it might be crucial for either considering the adoption of heparin prophylaxis or avoiding useless exposure to allogeneic blood components. Finally, the knowledge of a coagulation disorder might be advantageous to prevent additional analyses and prolonged hospitalization in further hospital admissions.

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