Thrombocytopenia in critically ill surgical patients: a case-control study evaluating attributable mortality and transfusion requirements

ABSTRACT

The present study suggests that thrombocytopenia of less than 50 × 109 platelets/l may be a marker for more severe illness and increased risk of death, rather than causative, because a true causal relationship is not established. Thrombocytopenia also leads to an excess of blood product consumption.

INTRODUCTION

Introduction Thrombocytopenia is a well known complication in intensive care unit (ICU) patients. It has been associated with various risk factors, but mainly with sepsis. The incidence of thrombocytopenia of less than 100 × 109platelets/l in ICU patients has been reported to vary from 23 to 41%, but lower frequencies (10■17%) have been reported for counts lower than 50 × 109 platelets/l. Mortality rates as high as 38■54% have been observed, and have been reported to be proportional to the nadir of the platelet count. Previous studies have not clearly demonstrated that thrombocytopenia results in increased mortality or increased transfusion requirements, however. Two independent factors have made this important and seemingly straightforward issue difficult to resolve. First, mortality rates are high in such patients for many reasons. Numerous studies have demonstrated that severe underlying illness predisposes to the development of thrombocytopenia in ICU patients, and the influence of thrombocytopenia on mortality is therefore difficult to assess. Although thrombocytopenia in the critically ill is more often a symptom than a disease process per se, it might increase mortality in several ways. Thrombocytopenia can result in a mild, moderate, or severe haemorrhagic disorder, which could enhance the risk of morbidity and mortality in critically ill surgical patients. The adverse effects of anaemia in such patients have also recently been discussed. Apart from its haemostatic effect, thrombocytopenia also increases the susceptibility to and severity of certain infections. Although several studies have found a relationship between thrombocytopenia and the likelihood of death, especially in septic patients, thrombocytopenia has rarely been identified as an independent predictive factor of death using multiple logistic regression. Nevertheless, these previous studies failed to reach any definite conclusions regarding whether thrombocytopenia per se was responsible for the poorer prognosis, or whether this higher mortality simply reflected more severe underlying illness. Second, the threshold value for severe thrombocytopenia that is supposed to jeopardize the prognosis is difficult to determine. We and others have suggested that a platelet count less than 50 × 109/l is associated with a poor outcome. Moreover, guidelines for platelet transfusion have proposed that the threshold value of 50 × 109 platelets/l is indicative of platelet transfusion requirement in surgical patients. One of the commonest methods to evaluate excess mortality is to perform a case-control study in which confounding variables (eg severity of underlying illness, reason for hospitalization, and so forth) are carefully matched in the two populations. To date, however, no case-control studies that have evaluated morbidity and mortality associated with thrombocytopenia in ICU patients have been published in which these important variables have been carefully matched. We therefore designed a case-control study to determine to what extent severe thrombocytopenia (defined as < 50 × 109 platelets/l) increases mortality and blood product requirements in surgical ICU patients.

CONCLUSION

The present report shows that thrombocytopenia of less than 50×109platelets/l is associated with excess mortality that is independent of the patient's age and initial severity of illness, and leads to excess blood product consumption, thus imposing a significant economic burden. Thrombocytopenia appears to be mostly a marker of severity of underlying processes, rather than causally related to death. Thus, the exact relationship between thrombocytopenia and mortality has yet to be elucidated, especially in septic patients. Further studies of the specific role of thrombocytopenia in shock and infections are necessary. Moreover, the risks and benefits of the various strategies for the management of thrombocytopenic ICU patients should be reevaluated in a variety of clinical settings.