THROMBOCYTOPENIA IN INFECTIONS

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ERRATA

Page numbering errors: Page 55 and 164 omitted, page 78 duplicated. Text is in correct sequence.

The platelet, a small structure circulating in the blood, has, in the past two decades, become an object which has attracted interest and research activity of impressive proportions. Most of this research has been directed towards answering some of the many complex questions underlying the functions of platelets in coagulation, haemostasis and their role in the pathogenesis of occlusive vascular disease and thrombosis.

Haemorrhagic and thrombotic complications can arise in association with a wide variety of pathological processes of different aetiology. In pestilential fevers, for example, the appearance of purpura and bleeding have, since the time of Hippocrates in the fifth century B.C., been recognized as grave signs usually foreshadowing death. Towards the end of the nineteenth century changes in the numbers of platelets circulating in the blood were noted in acute febrile illnesses. A reduction in the number of circulating platelets was noted in some infections but frequently the platelet numbers remained at normal levels or were even increased. This led to the belief that most of the haemorrhagic manifestations seen in fevers were the result of injury to the vascular endothelium caused directly by the micro-organisms of their toxins.

More recently it has been recognized that when micro-organisms or their toxins enter the blood stream they can interact with platelets and other coagulation factors. This may initiate clotting of the circulating blood. Multiple deficiencies of circulating haemostatic components may follow due to the consumption of platelets and other coagulation factors. If this is associated with the deposition of fibrin thrombi in the microvasculature it will cause ischaemic necrosis of the more distal tissues. This consumption of clotting factors can, if severe, result in a generalised bleeding diathesis. "Disseminated intravascular coagulation" or "consumption coagulopathy", terms which are generally accepted to describe this process, is now recognised as a complication of sepsis.

However, in addition to their haemostatic properties, platelets interact both *in vitro* and *in vivo* with particulate matter such as carbon particles, thorotrast, lipid emulsions and also with bacteria, endotoxins and viruses. These reactions in many ways resemble those of leucocytes. The coagulation system as a whole may not be significantly involved. This has led some authors to suggest the possibilit that platelets may, along with other cells of the body, play a part in resisting infections. Doubt still remains, however,

as to the exact mode and sphere of activity of platelets in this respect.

It is the purpose of this thesis to review the research made in this field to the present time, and to attempt to define more clearly the effect of bacterial infections on platelet number, and the relationship of these changes to the abnormalities in the coagulation system sometimes associated with infectious diseases.

To this aim changes in platelet numbers and some tests of haemostasis are examined in a number of patients admitted to the Royal Adelaide Hospital in whom infection was diagnose as the primary or predominant disorder. Alterations in platelet numbers and coagulation system are also examined in an experimental animal, the rabbit, in response to inoculations with various organisms and bacterial endotoxin.