ABO Rh Blood Groups and Platelet Transfusion *

By H. Pfisterer, St. Thierfelder and W. Stich

One of the great problems in the realisation of successful platelet transfusion therapy is to avoid the isoimmunization against specific platelet antigens. It is considered the cause for the decreasing effectiveness, when platelet or blood transfusions have been given before. Recently Bosch [3] has found that the survival time of platelets was mostly reduced after the second up to the 8th transfusion. In the near future blood banks preparing conserves of platelets will have to consider these specific platelet antigens between donor and recipient. In view of the large and still growing number of known platelet antigens it would be very helpful if the red cell groups ABO and Rh would not require additional consideration. Serological studies have established the presence of A and B antigens in human platelets, the occurrence of Rh antigens is still disputed. However, the survival of homologous platelets in ABO Rh-incompatibility is not known. Considering its practical importance we investigated this problem [4–6].

Methods

In order to examine the effect of ABO-incompatibility, two aliquots of $^{51}$Cr-labeled platelets from one donor were transfused to an ABO-compatible and an ABO-incompatible recipient (control). Both donor and recipient were Rh positive.

Platelet destruction caused by Rh-incompatibility can only be expected if the donor is Rh positive and the recipient Rh negative, but not in reverse. Further conditions are that Rh antigens are present on the platelets and that they can be engaged by Rh antibodies in such a manner that an intensified destruction of platelets occurs. Repeated platelet transfusions from Rh positive donors in Rh negative recipients will produce Rh antibodies in every case, when not as a result of the transfused platelets themselves but by the inevitable co-transfusion of a small count of red cells. These considerations led us to the following experimental set-up: labeled platelets from an Rh positive donor were transfused both to an Rh negative anti-D sensitized recipient and to an Rh negative non-sensitized recipient (control). Both donor and the two recipients were always ABO-compatible (fig. 1).

The sensitized recipients were volunteer permanent blood donors, who had been sensitized from a blood bank to obtain anti-D test serum. Preparation and transfusion of $^{51}$Cr-labeled “citrate platelets” and determination of platelet survival were essentially the same as described by Aster and Jandl [1] in 1964.


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Results

**ABO-Incompatibility**

The majority of blood platelets in ABO-incompatible recipients are destroyed in a process beginning soon after the transfusion and concluded after a few hours (fig. 2).

The sequestration of platelets, occurring both in compatible and incompatible recipients is nearly equal during the initial 10 to 30 minutes after transfusion.