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Albumin and the
Systemic Circulation

Volume Editors
B. Blauhut, Linz
P. Lundsgaard-Hansen, Bern

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and Blood Transfusion

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Drug Dosage
The authors and the publisher have exerted every effort to ensure that drug selection and dosage set forth in this text are in accord with current recommendations and practice at the time of publication. However, in view of ongoing research, changes in government regulations, and the constant flow of information relating to drug therapy and drug reactions, the reader is urged to check the package insert for each drug for any change in indications and dosage and for added warnings and precautions. This is particularly important when the recommended agent is a new and/or infrequently employed drug.

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Preface

The presentations and discussions during this International Workshop, which was held in Grindelwald on March 5-7, 1986, under the auspices of the Red Cross Foundation Central Laboratory of the Swiss Red Cross Blood Transfusion Service, focused on the importance of the colloid osmotic pressure generated by the plasma proteins for the organs and tissues perfused by the systemic circulation - a subject which has, as compared to the pulmonary problems, been rather neglected during the past decade.

Ms. S. Thüler and Mr. K. Diggelmann skillfully handled the organizational details before and during the meeting. Mr. J. Spinner and Ms. Precht ensured a flawless recording of the discussions, and Ms. Thüler carried the burden of typing and retyping altogether more than 200 pages of
discussions. The speakers supported us magnificently by a rapid delivery of their manuscripts, which were processed with customary speed and precision by Ms. D. Greder of the Karger Publishing Company. To all whose assistance was indispensable for the appearance of this Proceedings Volume, we wish to express our sincere gratitude.

The Editors

Introduction

A. Hässig

The Workshop for which we are gathering here today is the consequence of a collaboration, which has now lasted for more than two decades, between the University Department of Experimental Surgery in Bern headed by Per Lundsgaard-Hansen, and the Central Laboratory of the Swiss Red Cross Blood Transfusion Service directed by me.

It may be of interest if I sketch the origins and the results of this collaboration. Actually, the Central Laboratory of the Swiss Red Cross Blood Transfusion Service owes its foundation, which took place in 1949, to a gift of 20,000 units of dried plasma from the US Army to the Swiss Red Cross in December 1945. The Red Cross distributed those units to the hospitals in our country, and the doctors soon returned to the Red Cross desiring that it activate a production facility of its own, in order to ensure the national supply of this preparation, which they considered to be most valuable, from blood donated in our own country [1]. Accordingly, the production and distribution of dried plasma for civilian and military purposes topped the list of tasks allocated to the newly founded institute.

Before long, however, the transmission of hepatitis became a cause of serious concern. The introduction of single-donor freeze-dried plasma provided a partial answer to this problem [2-4], which was then definitively solved by the transition to PPF (abbreviated as PPL in Switzerland), and subsequently to the 5 and 20 % albumin solutions, all of which can be heat treated so as to inactivate any virus contained in the source plasma [5,6].

In the early 1950s, the relative importance of human plasma protein solutions and artificial colloids like polyvinylpyrrolidone and dextran for the treatment of hemorrhage and shock was still completely unknown. It occurred to me that the best way to examine this question was for the Central Laboratory to produce a plasma substitute of its own, as a supplement to the plasma protein solutions. At the 1954 Congress of the
International Society of Blood Transfusion in Paris, Tourtelotte presented his work on a modified fluid gelatin, which seemed to have the desirable properties. This prompted us to produce a gelatin plasma substitute of our own, which was quickly accepted by our medical profession under the name of Physiogel ®. In turn, this brought us into a head-on competition with the Swedish dextran marketed as Macrodex ®. In analogy with a debate that is still going on, the question was ‘Macrodex versus Physiogel - is one better?’ In our own country, Dr. Allgöwer and his co-workers contended that their studies on a rather limited number of animals left no conceivable doubt as to the superiority of dextran, which caused me to ask Per Lundsgaard-Hansen to check into this a bit more thoroughly. After about 2 years of intense investigations, his answer was ‘dextrans and gelatins’, considering that both have their advantages and disadvantages [7,8]. Since then, we have remained close friends. Per Lundsgaard-Hansen subsequently invested considerable efforts in demonstrating the applicability of blood component therapy to surgery and intensive care by hard data [9-11], and he also dealt extensively with the question of ‘albumin versus crystalloids’. Most recently, Barbara Blauhut, who has also done outstanding work on coagulation and antithrombin III [12-14], and Per Lundsgaard-Hansen have focussed on crystalloid-induced edema in tissues perfused by the systemic circulation, the effects of which seem to have been considerably underestimated [15], so that I hope that the participants of this workshop will come away with the conclusion that we actually need ‘albumin and crystalloids’.

I wish to thank Barbara Blauhut and Per Lundsgaard-Hansen for their valuable contributions to transfusion medicine, and all of you for accepting our invitation to contribute to this meeting, which is now opened.

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