

water-binding properties and membrane resistance, with their higher elastic component, as compared with the camel. The swelling of the corpuscle causes a counter-stress in the membrane which in turn counterbalances the extent of the swelling correspondingly; at a certain amount of swelling, the elastic wall ruptures under the additional stress. This contrasts with the behaviour of the less elastic and more viscous properties of the cell membranes of the camel erythrocytes.

It would appear, therefore, that the capability of the camel blood to resist high dilutions is due to a number of causes, among these the increased binding capacity of the erythrocyte components for water and the large swelling capability shown by these corpuscles.

Investigations on the cell membrane components and its structure are being carried out at the present time.

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IMMUNOLOGY

Immunological Changes and Therapeutic Effects of Convalescent Serum after Injury by Burns

IMMUNOLOGICAL changes after burns, induced by the breakdown of damaged skin tissues, were discussed half a century ago. Recently, reports from American and Russian authors seem to indicate the formation of antibodies against body-own burned skin, and also for the therapeutic value of convalescent serum. We have tried to confirm these findings.

Rabbits, guinea pigs, rats and mice were subjected to exact reproducible burns of third degree and 25 per cent extent in general anaesthesia. Sensibilization was performed by the intraperitoneal injection of extracts obtained from burned rabbit, guinea pig and rat skin, excised 2-96 h after a burn, or by implantation of excised burned skin into the peritoneal cavity of rats or guinea pigs. Convalescent serum from rabbits and rats was obtained by bleeding 3-4 weeks after the burn.

For testing the formation of antibodies, the following serological methods were used: Ouchterlony technique, Schultz-Dale technique, complement-binding-reaction, skin sensitization test. For determination of the effects of convalescent serum, the following criteria were used: blood cell counts, plasma histamine-level, blood pressure, water content of the parenchymatous organs in rats, finally the survival time and rate after, if untreated, lethal burns in mice, and the mortality rate after injection of burned skin extracts.

In the Ouchterlony technique, all sera of sensitized guinea pigs gave positive reaction with extracts of burned skin from rabbits and with some extracts of burned skin from guinea pigs. All sera of sensitized rabbits reacted negative with extracts of burned rabbit skin. All sera of sensitized animals, both guinea pigs and rabbits, gave

negative reaction with normal skin extracts, except one serum of a guinea pig.

In the Schultz-Dale preparation, after adding extracts of burned skin, the sensitized guinea pig uterus showed contractions of 30-75 per cent more than after addition of normal skin extracts. It is unlikely that histamine was responsible for this effect, since the burned skin extracts contained less histamine than those of normal skin.

Skin reactions could not be induced in sensitized guinea pigs by burned skin extracts. Complement-binding reactions gave negative results.

The determination of the effects of convalescent serum, injected in 2-ml. amounts intraperitoneally to rats subjected to burns as already described, in comparison with same amounts of normal rat serum or 0.9 per cent solution of sodium chloride, gave the following results.

Post-traumatic leucocytosis was reduced by normal and convalescent serum in the same degree; but not by sodium chloride. The histological picture in liver and kidney was not influenced by the application of the sera. The increase of water content of organs, well known after burns, was reduced by convalescent serum in the liver, with slight significance. Plasma histamine increase 1 h after burn was nearly completely inhibited by normal and convalescent serum, without significant difference. Fall in blood pressure, as measured from the rat tail, was not altered by the sera or by sodium chloride. Convalescent serum injected in guinea pigs did not show any increase of the survival time and the survival rate of these animals.

Survival time of lethally burned mice was prolonged by sera far more than by sodium chloride, but without any difference between the sera. Significant influence on blood pressure and on survival time and rate was only observed after injection of a protease inhibitor ('Trasyolol R').

Our findings support the hypothesis of the development of immunological changes after burns, but they give no evidence for any protective action of convalescent serum in the therapy of post-burn disturbances. The interval between trauma and excision of burned skin, and also the method of extraction, seem to be of special importance for the results obtained in serological techniques.

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Effect of Neonatal Thymectomy, Bursectomy and Thymo-bursectomy on Hæmagglutinin Production in Chickens

SINCE the demonstration by Glick *et al.*¹ that bursectomized chickens have a reduced ability to produce antibodies to *S. typhimurium*, a large body of evidence has shown the importance of the bursa of Fabricius in the development of antibody-forming capacity in birds. Mammals thymectomized in early life are unable to manufacture antibodies against certain antigens². However, the role of thymus in the development of immunological potential in chickens is not clearly established. The work recorded here compares the relative roles of thymus and bursa in hæmagglutinin production in chickens.

Rhode Island Red chickens were thymectomized, bursectomized and thymo-bursectomized 2 days after hatching. One group of 9-week-old bursectomized chickens was grafted with bursa from newly hatched chickens implanted between parietal and visceral peritoneum. A second group was grafted with bursa from 8-week-old birds. An additional group of chickens was bursectomized at the age of 8 weeks. At 10 weeks all groups were