Hypersensitivity Reactions in Experimental Leptospirosis

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The development of a delayed type hypersensitivity reaction between cell-bound antibodies and leptospiral antigen may be involved in clinical complications following leptospiral infection. This hypothesis was brought up as one of the possible explanations [Jubb, K. V. P. and Kennedy, P. C, 1963 in Pathology of Domestic Animals] for the post-leptospirosis ophthalmia occurring in some human and animal cases [Alston, J. M. and Broom, J. C, 1958 in Leptospirosis in Man and Animals, Livingstone, Ltd.].

The purpose of the present work was to investigate whether an ocular hypersensitive reaction resembling post-leptospirosis ophthalmia can be produced experimentally and in the affirmative case, compare its specificity (genus or serotype specific) with the specificity of humoral antibodies, immediate and delayed intradermal reactions.

The experiments were performed either in dogs or guinea pigs. The animals were checked before the experimental infection for presence of leptospiral antibodies and found negative. Mild infections were induced in dogs by two subsequent injections either with *Leptospira canicola* strain or *L. grippotyphosa*.

The sera of infected animals were tested at various intervals after the first and second injection. Type specific antibodies (microscopic agglutination) as well as genus specific antibodies (indirect and complement fluorescent staining with the saprophytic strain of *L. patoc*) were detected after the first injection. Only type specific antibodies were found after the second injection.

Ocular and skin tests were carried out after the second injection on the 120th day following the primary infection. Positive ocular reactions,

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as well as delayed type skin reactions, were detected with soluble extracts of the homologous strain only, while immediate reactions (active cutaneous anaphylaxis) could also be induced with soluble extracts of heterologous leptospiral strains. The ocular reaction appeared first at 24-32 hours after injection and was strikingly similar to post leptospirosis ophthalmia as expressed by congestion of the conjunctiva, corneal oedema and clouding of the aqueous humour. Histological sections revealed massive infiltration of the cornea and ciliary body with inflammatory cells, mainly lymphocytes.

Experiments done with *L. canicola*, *L. grippotyphosa* and *L. patoc* in guinea pigs also showed occurrence of delayed ocular reaction specific to the homologous strain at a stage when type specific antibodies were detected in the sera of animals.

The results obtained in dogs and guinea pigs indicate that an ocular reaction resembling post-leptospirosis ophthalmia can be reproduced experimentally. These reactions were of delayed type and in analogy to delayed skin reactions, confined to the homologous strain. These findings suggest the possibility of using a delayed skin test for detection of the causal organism in leptospirosis.