KERATOPLASTICS AND DONOR'S AND RECIPIENT'S SELECTION ACCORDING TO HUMAN TRANSPLANTATION ANTIGENIC SYSTEMS

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The problems of keratoplastics (K) have a long history, a rich presence and a perspective future, While at the time of Filatov, Elsching and others the problems of surgical technique were most important, nowadays together with perfecting of eye microsurgery the corneal transplant darkening is related to biological incompatibility between donor's and recipient's tissues. The transplantologists point two ways of solving this problem. 1. Suppression of recipient's immune system by immunodepressants. 2. Donor's and recipient's selection according to human transplantation antigenic systems.

65 years ago Elsching suggested that, probably, the incompatibility between donor and recipient according to erythrocyte antigens of ABO system causes transplant darkening after K. While the compatibility according to ABO and Rhesus systems is important in cases of transplantation of other tissues and organs (8) the data concerning K are controversial in this respect, indeed.

D. G. Bushmich et al. (1972) investigated a lot of penetrans K and point out that donor's and recipient's selection increased the percentage of transparent surveillance of transplant up to 71,2 % while it varies in the ranges between 25—61 % without any selection. M. Allansmith et al. (1975) studied 150 pairs donorrecipient in 25 % of which there was no compatibility according to ABO and Rhesus antigenic systems. They considered that if before K some cases of recipient's sensibilization occured (transplantation, pregnancy, chemotransfusion), ABO selection of both donor and recipient is required without being the only and absolute guaranty for success.

Y. Salisbury et al. (1981) ascertained the presence of erythrocyte antigens A, B and D in corneal epithelium and endothelium and less in its stroma. They accepted that blood group antigens could not initiate an immune reaction of type HVG but when it has already started they could be involved in it and support it antigenically.

It is noteworthy to mention that all immune interactions are much better expressed at the presence of corneal vascularization and beforehand recipient's sensibilization. This could explain to a certain degree the contradictory data in literature concerning selection in K according erythrocyte antigenic systems.

The discovery of tissue compatibility antigens presents a new period in selection investigation of allogenic corneal transplantation tissue.

U. Gronemeyer et al. (1974) performed an interesting experiment of K with rats of inbred lines. They demonstrated that independently of quite small size of transplant a recipient's sensibilization set in which can induce an immunologic rejection of transplantated tissue. This can be avoided after beforehand typization and donor's selection as well recipient's selection according to the system of transplantation tissue antigens. Later on these authors (1974) support the proved

by D. Newson et al. (1974) that HLA rich antigens are not only both epithelium and endothelium but also corneal stroma, on the basis of morphologic investigations of the reaction "Rejection of the transplant".

The effect of tissue compatibility on the biological result after K in man is studied since 1968 (N. Ehlers et al, 1971). Some authors (4, 11) point that besides according to ABO and Rhesus systems both donor and recipient have to be selected also according to their HLA belonging. Minimally, two of four HLA antigens (locus A and B) of the donor must be identical with HLA antigens of recipient. This is especially of importance when there is an expressed corneal vascularization of the recipient.

S. Vannas (1975) proved that it is necessary to select both donor and recipient according to ABO and HLA antigens. The great polymorphism of HLA system could quite rarely allow the coincidance of two or of more antigens in clinical practice but it can be achieved by organization of a bank with cryoconserved corneae.

Donor's and recipient's selection is very essential in cases with corneal leucomas which have a bad prognosis concerning K (presence of beforehand recipient's sensibilization after pregnancy, chemotransfusions, transplantations; strongly expressed corneal vascularization).

H. Volker-Dieben et al. (1977) report a correlation of the reaction of "rejecting" of donor's cornea with the degree of vascularization and it occured in 17 till 31 % of their cases.

In case of successful donor's and recipient's selection the reaction of "rejection" of the transplant occurs quite seldomly and if present it is easily reversible under the influence of corticosteroid therapy.

According to C. C. Kok-van Alphen et al. (1978) the late transplant darkening is an often consequence of lately developing immunologic reaction but not of recidive of herpes infection.

The contradictory literature data about the necessity of donor's and recipient's selection according to ABO and HLA systems are related with a number of still unclarified problems which belong more to general transplantology than to practical achievements of K. The studies of some authors (2, 5, 6, 9) relate more definitely the transparent surveillance of the transplant after successful selection according to aforementioned systems with the etiology of leucomas, respectively with the degree of their vascularization. The clinical picture of the so-called Greffon's disease, initially described by Paufique in 1948, is quite well presented in the works of many authors. However, the discrete immunologic interactions between recipient and donor are hardly detectable (5, 6).

Very early after K in the organism the mechanisms of both humoral and cell-mediated immunity are involved ("tissue typing", 1973). As response to antigenic stimulus of the transplant a generalized transplantation immunity reaction develops accompanied with a local reaction.

W. Stark et al. (1973) search for cytotoxic HLA antibodies in recipient's serum before and after K of vascular leucomas. They accept that the presence of cytotoxic HLA antibodies correlates with the reaction of transplant "rejection". According to them this presence is important also for the reversibility of the immune reaction after therapy with immunodepressants.

In their last reports W. Stark et al. (1978) paid attention to humoral immunity before and after K. Before any transplantation they had performed a cross match test between recipient's serum and donor's lymphocytes. The positive result was contraindication for K. It demonstrates that recipient possesses antibo-

dies against some of donor's tissue antigens. The negative cross-match test permitted K by using this donor's tissue. The low percentage (15 %) of immunologic transplant "rejection" after K in cases of vascular darkening is related according to W. Stark with donor's selection according to cross-match test. He doesn't search for selection according to ABO and HLA systems because he considers that the positive result after corneal transplantation doesn't depend on the number of donor's and recipient's identical antigens but on the number of performed retransplantations.

On the other hand, other investigators have the opposite opinion (6, 9). They point out the importance of donor's and recipient's selection according to ABO and HLA systems for transparent surveillance of corneal transplant.

The literature data about donor's and recipient's selection in K are quite contradictory, indeed. Probably, the vascular leucomas (of IIIrd, IVth and Vth classes after Filatov—Bushmich's classification) will require tissue selected donor's material. This will be essential in the so-called "bad risk cases" — leucomas with poor prognosis: darkened transplant after Greffon's disease, presence of sensibilization of the recipient.

At this great polymorphism of HLA system the way to successful selection of donor's material could be provided by the bank with cryoconserved corneae.

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КЕРАТОПЛАСТИКА И ОТБОР ДОНОРА И РЕЦИПИЕНТА ПО ТРАНСПЛАНТАЦИОННЫМ АНТИГЕННЫМ СИСТЕМАМ ЧЕЛОВЕКА

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РЕЗЮМЕ

Авторами обсуждается характер приживания персаженной роговицы после кератопластики в зависимоси от донора и реципиента по эритроцитарной (АБО) и тканевой (HIA) трансплантационнымтантигенным системам человека.