

DISTRIBUTION OF TRANSPLANTATION ANTIGENS IN INHABITANTS OF MOSCOW

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UDC 612.6.02.017.1:612.118.221.1]:
31(470.311)

Monospecific antisera were used to study the distribution of transplantation antigens among 120 inhabitants of Moscow. The results are compared with those of similar investigations in other countries.

Intensive study of transplantation antigens began in 1958 when Dausset discovered the first of the leukocytic antigens, Mac (HL-A2 in the W.H.O. nomenclature).

Since then more than 20 transplantation antigens have been found at the European and American tissue typing centers [2], most of them determined by the HL-A locus, the principal locus of tissue incompatibility in man.

Six antigens, whose existence and identity with each other were confirmed in 1969 at all the leading typing centers of the world, have been given a W.H.O. nomenclature [6]: HL-A1, HL-A2, and HL-A3 corresponding to sublocus I of the HL-A system, and HL-A5, HL-A7, and HL-A8, corresponding to sublocus II of the HL-A system.

In addition, at each sublocus of the system there is a group of antigens whose identity with each other has not yet been established by all typing centers and which are designated by abbreviations of the names of their discoverers.

An important aspect of the study of transplantation antigens is the determination of their distribution among the populations of different countries. This is an essential task, for it enables the selection of donor-recipient pairs to be planned and the outcome of operations to transplant organs and tissues to be predicted.

TABLE 1. Incidence of Occurrence of Transplantation Antigens (in %)

Nomenclature of antigens	Russians*	French [5]	Dutch [9, 10]	Italians [3]	Americans [1]
HL-A1	21	21	—	21	25
HL-A2	22	53	—	44	51
HL-A3	18	31	—	26	35
HL-A5	20	13	—	—	—
HL-A7	15	29	—	—	—
HL-A8	19	16	23	20	—
Da 34a (V-R)	35	71	66	75	—
Da 74b (V-R)	49	65	90	—	—
6a (V-R)	67	—	—	—	—
6b (V-R)	27	—	—	—	—
Da-Dausset 5b (V-R)	66	97	—	—	—
v-R-van Rood	—	—	—	—	—

*Inhabitants of Moscow.

The distribution of transplantation antigens has been studied, with varying degrees of thoroughness, among the inhabitants of France [5], the United States [1], Italy [3], and Holland [9, 10]. No study of the distribution of transplantation antigens among the Russian population has hitherto been made.

Since Moscow hospitals have begun planned organ transplantation operations, there is an urgent need for this deficiency to be remedied.

This paper describes the results of a study of the distribution of transplantation antigens among 120 inhabitants of Moscow.

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EXPERIMENTAL METHOD

Standard monospecific antisera were generously provided by Professors Van Rood (21 sera) and Dausset (10 sera), to whom the writers record their gratitude.

By means of the monospecific sera obtained from European typing centers it was possible to detect 14 antigenic groups, characterizing to an adequate degree the subloci I and II of the HL-A system and Van Rood's fourth and sixth antigenic groups. In addition, a serum against antigen 5b [8], which does not belong to the HL-A system [4, 12], was provided.

Each of the antigens was detected by a "battery" consisting of two to three active sera. Two tests were used: leukoagglutination and lymphocytotoxic. The leukoagglutination test was used in Van Rood's modification [11], with addition of EDTA.

The cytotoxic test was carried out by Kapitchnikov's method [7] with trypan blue, the lymphocytes being isolated by successive centrifugation. The test was regarded as positive if the number of drying lymphocytes was at least three times greater than in the control. Before the tests the sera inactivated at 56°C for 30 min.

EXPERIMENTAL RESULTS

The results of the investigation are given in Table 1 where, for comparison, the incidence of the corresponding antigens in Western European and American populations is also given. The results show that there is no significant difference between the frequency of distribution of most of these antigens among the inhabitants of Moscow and among Western European and American populations. Definite correlation exists with the HL-A3, HL-A5, and HL-A8 antigens.

The results of determination of HL-A1 antigen among the French and Muscovites agreed completely. Antigen 4b is one of the most widespread (49%), but it does not occupy such a dominant position as among the population of the Netherlands, where it is found in 90% of cases. Just as among the French population, the incidence of antigen 5b is very high.

At the same time there are appreciable differences between the inhabitants of Moscow and the compared populations as regards the distribution of HL-A2 and 4a (Da 3) antigens. The present investigation showed that their incidence is lower than among the inhabitants of some European countries and among Americans.

Of the transplantation antigens now known, it is thus clear that 5b and 6a are definitely dominant among the Moscow population; about half of the population have antigens of Van Rood's groups 4 and 6; one fifth have antigens of sublocus II; between one quarter and one fifth have antigens of sublocus I of the HL-A system.

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