BLOOD GROUPS IN ANKYLOSING SPONDYLITIS

BY

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Since the discovery of Aird, Bentall, and Fraser Roberts (1953) of an association between cancer of the stomach and blood group A, many studies on a possible relationship of blood groups to disease have been carried out. Cohen, Boyd, Goldwasser, Cathcart, and Heisler (1963) investigating the blood groups of patients suffering from various articular diseases, found a significant correlation between the absence of the Rh antigen D and rheumatic disease. There also seemed to be a correlation with the absence of the antigen N of the MNSs system, whereas no correlation was found with the ABO system. The two major disease groups studied by Cohen and his co-workers were rheumatoid arthritis and ankylosing spondylitis, each representing 31 patients among a total of 99 persons examined.

In an attempt to find out which of the diseases included in the study of Cohen and others (1963) that might be responsible for the deviation in blood group distribution, Kornstad, Kornstad, and Guldborg (1965) studied the blood groups of 217 patients suffering from definite or classical rheumatoid arthritis. They were unable to find any correlation between the disease and the ABO, MN, or Rh(D) blood groups.

The purpose of the present investigation was to find out whether patients suffering from ankylosing spondylitis could have caused the deviation(s) in blood group distribution observed by Cohen and others (1963). Besides the MN and Rh(D) groups, the I blood groups were also examined. The reason for including the I grouping was the evidence pointing to "a mycoplasma as having some part in causing Reiter's syndrome and ankylosing spondylitis" (Leading article, *Brit. med. J.*, 1965) and the observation by Schmidt, Barile, and McGinniss (1965) that eighteen of 25 mycoplasma tested could block or destroy the I receptors of normal red cells.

Material and Methods

Blood samples were obtained from 200 patients suffering from ankylosing spondylitis. All the patients had been examined at the University Hospital for Rheumatic Diseases, the great majority of them as in-patients. The samples were kept in the refrigerator until they could be tested, which was always done

within 5 days after the blood was collected. The blood grouping was performed at the National Blood Group Reference Laboratory and Immunopathology Laboratory, State Institute of Public Health. The blood grouping sera used were all prepared at the same laboratory. Rabbit anti-M and anti-N sera were used, the other sera being of human origin. Each blood specimen was Rh(D) grouped independently by two skilled technicians, using saline reacting anti-D sera. No discrepancy between their results was observed. The D-negative samples were also tested with anti-C and anti-E. For I-grouping an isoagglutinin from a healthy group A₁B, I-negative donor was used. This antiserum, which has been mentioned previously (Kornstad, 1962), belongs to the variety of anti-I which reacts best with O and A₂ cells; it also reacts with cells carrying the A₁ and B antigens.

The results obtained were compared with the blood group frequencies in the normal Norwegian population previously found at the same laboratory: Hartmann and Lundevall (1944) study of the ABO and MN distribution; Hartmann (1949) observations on the incidence of the Rh antigen D; and Kornstad (1964) study of the MN groups in Oslo blood donors. When the blood group distributions in the normal population and in the ankylosing spondylitis patients were compared, 2 × 2 tables were used for calculation of the χ^2 values.

Results

The results of the Rh(D) testing are shown in Table I. Among the 26 D-negative patients, 25 were also C-negative and E-negative, whereas one belonged to the Rh genotype dcE/dce. The last patient was tested for D^u, with negative results. There was no significant difference in the incidence of the Rh antigen D in the two groups ($\chi^2 = 0.9072$; 1 d.f.; $0.35 > P > 0.30$).

The results of the MN testing are given in Table II. When the total number of M and N genes observed in the two series were compared, we found $\chi^2 = 0.6779$; 1 d.f.; $0.45 > P > 0.40$.

All the ankylosing spondylitis patients were found to be I-positive.

Discussion

Among Norwegian patients no support has been found for the assumption that a correlation exists

TABLE I
RESULTS OF Rh(D) TESTING

Series	D-Positive	D-Negative	Total
Normal Controls (Hartmann, 1949)	20,337	3,714	24,051
Ankylosing Spondylitis	174	26	200

TABLE II
RESULTS OF MN TESTING

Series	M	MN	N	Total
Normal Controls (Hartmann and Lundevall, 1944; Kornstad, 1964) ..	4,989	8,115	3,438	16,542
Ankylosing Spondylitis	63	101	36	200

between rheumatic disease and absence of the Rh antigen D or absence of the N antigen; patients suffering from rheumatoid arthritis (Kornstad and others, 1965) or ankylosing spondylitis show Rh(D) and MN groups in good agreement with the normal distribution. While the present study was in progress, Stoia, Ramneantu, and Poitas (1967) reported the finding of 369 Rh and 42 rh persons among 411 Romanian patients suffering from rheumatoid arthritis. This should give an Rh(D) frequency of 89.8 per cent. as compared with 85.0 per cent. in a control group. The difference seemed to be statistically significant, but as the deviation from the normal distribution in their series was opposite to that observed by Cohen and others (1963), it seems reasonable to conclude that no correlation

between Rh groups and rheumatic disease has so far been proved.

The finding that all the 200 ankylosing spondylitis patients were I-positive is also in good agreement with the findings in normal adult populations where more than 99.9 per cent. are known to be I-positive. If a mycoplasma plays any causative or secondary role at all in ankylosing spondylitis, it does not block the I-antigenic sites on the patients' erythrocytes.

Summary

Blood samples from 200 patients suffering from ankylosing spondylitis were tested for MN, Rh(D), and I blood groups. In these systems a normal distribution was found.

REFERENCES

- Aird, I., Bentall, H. H., and Roberts, J. A. Fraser (1953). *Brit. med. J.*, **1**, 799 (A relationship between cancer of stomach and the ABO groups).
- Cohen, A. S., Boyd, W. C., Goldwasser, S., Cathcart, E. S., and Heisler, M. (1963). *Nature (Lond.)*, **200**, 1215 (Correlation between rheumatic diseases and Rh blood groups).
- Hartmann, O. (1949). Personal communication quoted by Race and Sanger (1950).
- and Lundevall, J. U. (1944). "Blood Group Distribution in Norway, with Special Regard to the MN and OA₁A₂B System". *Norske Vidensk.-Akad.*, Oslo.
- Kornstad, A. M. G., Kornstad, L., and Guldberg, D. (1965). *Nature (Lond.)*, **206**, 836 (Blood groups in rheumatoid arthritis).
- Kornstad, L. (1962). *Nord. Med.*, **68**, 1597 (Serologisk diagnostikk ved autoimmunhemolytiske anemier).
- (1964). Unpublished observations quoted by Kornstad and others (1965).
- Leading Article (1965). *Brit. med. J.*, **1**, 607 (Is rheumatoid arthritis an infection?).
- Race, R. R., and Sanger, R. (1950). "Blood Groups in Man", 1st ed., p. 91. Blackwell, Oxford.
- Schmidt, P. J., Barile, M. F., and McGinniss, M. (1965). *Nature (Lond.)*, **205**, 371 (Mycoplasma (pleuropneumonia-like organisms) and blood group I; associations with neoplastic disease).
- Stoia, I., Ramneantu, R., and Poitas, M. (1967). *Ann. rheum. Dis.*, **26**, 332 (Blood groups ABO and Rh(D) factor in the rheumatic diseases).

Groupes sanguins dans la spondylarthrite ankylosante

RÉSUMÉ

On détermina chez 200 malades atteints de spondylarthrite ankylosante les groupes sanguins MN, Rh(D) et I. On trouva une distribution statistiquement normale de ces groupes.

Grupos sanguíneos en la espondilartritis anquilosante

SUMARIO

En 200 enfermos con espondilartritis anquilosante se determinaron los grupos sanguíneos MN, Rh(D) e I. La distribución estadística de estos grupos fué normal.