

the winter. Since the treatment described is simple and apparently effective, to advocate its use would appear realistic in spite of our lack of knowledge regarding the aetiology of the condition.

Summary

Neuralgic pain commonly follows fracture of the nasal bones. It may begin at the time of injury or its onset may be delayed for three months or longer. It is due to incomplete injury of the lateral nasal nerve.

Twelve cases of nasal neuralgia were treated by infiltration of the lateral nasal nerve with 2% lignocaine. Relief

of pain was achieved in all 12 cases, and was maintained at follow-up from 3 to 12 months later.

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ABO BLOOD GROUPS AND ACUTE HEPATITIS*

BY

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Several recent reports have been concerned with the relation between ABO blood group and resistance to infectious disease. Vogel, Pettenkofer, and Helmbold (1960) suggested that differential susceptibility of persons of blood group O and A to plague and smallpox may have contributed to the present-day world distribution of human ABO blood groups. At first it seemed that the hypothesis was supported by experimental evidence of an antigenic similarity between human blood group A substance and vaccinia virus, but further work has not confirmed this (Harris, 1963). In a recent study in Royal Air Force personnel we found a considerable excess of group O and a corresponding deficiency of group A patients among those infected with influenza A2 virus, and an opposite trend in adenovirus infections (McDonald and Zuckerman, 1962).

Associations of this kind may be coincidental, and only laboratory investigation can be expected to show whether there is any mechanism which would explain them. In the meantime a study of blood-group distribution seems worth while in any infectious disease where there is the opportunity. Acute hepatitis is a common illness, particularly in military populations. We have recently completed an epidemiological survey of this disease in the Royal Air Force covering the period 1957 to 1962. This enabled us to make some observations on blood-group distribution which form the subject of this paper.

Materials and Methods

Medical records of 905 serving members of the Royal Air Force who suffered from acute hepatitis with jaundice between January, 1957, and June, 1962, were examined for evidence of ABO and rhesus blood group. This information was found for 384 men, almost all the remainder of the men having joined the Service before 1956, when routine testing of recruits for blood group began. Six of the 384 had been born outside the British Isles, leaving 378 on which the analysis has been based.

The distribution of blood groups to serve as a control was based on the same sample of 47,108 R.A.F. recruits used in our previous study (McDonald and Zuckerman,

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1962). The results from this sample and for the patients with hepatitis were divided into three regional groups according to the place of birth. Counties south of a line from the Wash to the Severn were included in region 1, the remaining counties of England and Wales and four in South-west Scotland in region 2, and the rest of Scotland and Ireland in region 3.

Results

The distribution of the ABO blood groups and Rh factor in the 378 patients with hepatitis is shown in Table I. The observed percentage of patients in each blood group and the expected proportions calculated from the control figures, making due allowance for the regional constitution of the observed group, are shown in Table II. There was a deficiency of group O and an excess of group A in each geographical region, least evident in region 1. There was also a trend towards an excess of groups B and AB, but the numbers in these groups were small and the trend was not consistent in each region. The statistical significance of the differences between the distribution of blood groups O and A for the controls and for the patients was tested by the method of Woolf (1955). The difference was significant ($\chi^2=6.019$; $P<0.014$) (Table III), and though the trend was not equally apparent in all three geographical regions the χ^2 value for heterogeneity (3.934) was not significant ($P>0.1$).

The proportion of patients Rh-negative in each geographical region showed only minor variations (Table I).

TABLE I.—*Distribution of ABO Blood Groups and the Rhesus Factor in 378 Patients with Acute Hepatitis*

Region of Birth	No. of Patients	Group				Rhesus Factor		
		O	A	B	AB	Positive	Negative	Not Known
1	200	79	94	24	3	164	33	3
2	124	51	59	9	5	101	21	2
3	54	16	26	8	4	43	11	0

TABLE II.—*Observed (O) and Expected (E) Blood-group Distributions*

Region	No. of Cases	Group O		Group A		Group B		Group AB	
		O (%)	E (%)	O (%)	E (%)	O (%)	E (%)	O (%)	E (%)
1	200	39.5	43.7	47.0	45.2	12.0	8.0	1.5	3.0
2	124	41.1	47.2	47.6	41.2	7.3	8.6	4.0	3.0
3	54	29.6	50.5	48.2	35.3	14.8	10.9	7.4	3.3
Total..	378	38.6	46.0	47.3	42.3	10.9	8.7	3.2	3.0

TABLE III.—Relative Incidence of Blood Groups A and O in Patients with Acute Hepatitis by Geographical Region

Region	No. in Disease Series	Relative Incidence A : O	χ^2
1	200	1:151	0.841
2	124	1:324	2.137
3	54	2:322	6.975
Total	378		9.953
χ^2	Difference from unity D. of F. = 1 Heterogeneity D. of F. = 2		6.019 $P < 0.014$ 3.934 ($P > 0.1$)

Discussion

Buchanan and Higley (1921) examined the blood-group distribution of 2,446 patients suffering from a variety of diseases, classified in 17 groups, admitted to the Mayo Clinic from January, 1917, to May, 1921. They concluded that there was no relation between blood groups and disease, but later examination of their figures (Roberts, 1957) showed that in 173 cases of "jaundice, all causes," there was an excess of group A. In the original paper, neoplasms, cholelithiasis, acute and chronic gall-bladder disease, splenic anaemia, secondary anaemia, and pernicious anaemia were excluded from "jaundice, all causes," but we do not know how many of the 173 cases were due to infectious hepatitis. Billington (1956) also found an excess of group A in 111 patients with cirrhosis of the liver, most of whom had bleeding oesophageal varices. Our observations provide further evidence for an association of group A with a disease of the liver, more certainly infective in origin.

A similar group A excess was noted in our earlier study for illnesses due to adenovirus, which, like the agent of infectious hepatitis, appears able to infect man by both respiratory and alimentary routes. The virus responsible for human hepatitis has not yet been identified but is almost certainly unrelated antigenically to the adenovirus group. There is evidence that infectious canine hepatitis is due to an adenovirus (Kapsenberg, 1959) and that adenovirus type 5 may cause pathological changes in the liver tissue of hamsters (Pereira, Allison, and Niven, 1962), but there is no indication of any association between adenovirus infection and hepatitis in man. These points tend to suggest that the mechanism underlying the relation

between blood groups and infection, whether immunological or epithelial, is not highly specific.

The excess of group O in Asian influenza was observed in a population meeting the A2 virus for the first time. The group A excess in both adenovirus infection and infectious hepatitis, on the other hand, was found in adults already exposed to both diseases for many years. Our findings in hepatitis and adenovirus infection could therefore be explained in at least two different ways. It might be due to a natural resistance to these infections associated with group O; alternatively, persons of group A may possess more than average resistance to virus infection and so find themselves relatively unprotected in adult life by naturally acquired active immunity.

Summary

The ABO and Rh blood-group distribution of 378 cases of acute hepatitis in the R.A.F. was compared with that for a sample of 47,108 recruits, making due allowance for region of birth. The patients with hepatitis showed an excess of group A and a corresponding deficiency of group O ($P < 0.014$). This and findings previously reported in adenovirus and influenza virus infections suggest that any differences in susceptibility to virus disease associated with blood group are not highly specific.

We are indebted to a number of persons for their contribution to this study—Dr. A. C. Kopeć for allowing us to use for control purposes figures from an analysis of blood groups in R.A.F. recruits; to Dr. J. A. Fraser Roberts for his advice; to Mrs. Judith Munk for statistical assistance; and to the staff of the Medical Records Section of the Air Ministry for their help. We thank the Director-General of Medical Services, Royal Air Force, for granting facilities for this study and for permission to publish the results.

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TRIAL OF A POWDERED FORMULA DIET IN TREATMENT OF OBESITY

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In recent years a new method for restricting the calorie intake of the obese has evolved—namely, the use of the low-calorie concentrated "formula" diet. This diet is of known calorie value and chemical composition, and supplies all the nutritional needs of an individual except energy. The formula diet is usually marketed as a powder or liquid concentrate to which water is added to make a drink. This is taken at meal times in place of ordinary food. Variety is achieved by alternating flavours, by chilling or warming the drink, and by permitting the use of low-calorie foods such as green vegetables. Among the public these formula diets have recently enjoyed a consider-

able wave of popularity (*Time*, 1961), and large quantities have been consumed in Britain and elsewhere, usually without medical supervision. Medical opinion upon the desirability of this method of weight reduction appears to be divided. The Food and Nutrition Council of the American Medical Association (1961) considered the use of formula diets as undesirable, largely on the grounds that they encourage spasmodic self-medication and do nothing to remove the underlying cause of obesity. Other authors (Cass, 1961; Tullis and Allen, 1961; Roberts, 1962) report satisfactory weight loss by selected groups of obese patients treated with such diets.

We now report a study designed to assess whether the obese patient would adhere to his regime and lose weight

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