THE ABO BLOOD GROUPS AND PEPTIC ULCERATION

A SURVEY OF 1,080 CASES ON SOUTH TEES-SIDE

BY

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The possibility of the relationship of the ABO blood groups to disease has been investigated by many workers during the past 40 years, and their results have been carefully analysed by Fraser Roberts (1957), who concluded that, in the case of duodenal ulceration, there was overwhelming evidence that persons with group O blood were 40% more susceptible than those of other groups. With regard to gastric ulcers, he was of the opinion that the figures are about intermediate between those of duodenal ulcers and the controls, even allowing for the fact that some of the ulcers near the pylorus may have been misclassified.

My own series consists of 1,080 peptic ulcer patients on whom I have performed partial gastrectomies since coming to Tees-side. Thus all cases are ulcers proved at laparotomy.

The controls were obtained from Fraser Roberts's (1953) analysis of the ABO blood-group records of the North of England Blood Transfusion Service. In this district are areas 67 to 72, inclusive, from which nearly all my patients have come. As the total number of donors in each section is given and not the number of donors in each blood group, the latter have been calculated from the percentage group-frequencies and then the total number of the donors in the whole area, the numbers of donors in each group, and, finally, the percentage group-frequencies in the whole area. It was considered that this would provide more accurate control figures for the purpose of this investigation. These are given in Table I.

TABLE I.—Control Figures Obtained from 4,540 Blood Donors in South Tees-side. Compiled from Fraser Roberts (1953)

	AB	A	B	O
Group numbers ..	132	1,873	386	2,149
.. frequencies	2.91%	41.26%	8.50%	47.33%
Highest	3.62%	42.31%	12.36%	50.39%
Lowest	2.18%	38.24%	7.75%	45.82%

Results

In Table II I have given an analysis of the blood groups in 722 cases of duodenal ulcer. This shows that there is an increase in the frequency of group O by 24.7% to 59.0%, compared with the control of 47.33%. Group A, on the other hand, shows a decrease of 15.8%. The decrease in group B is statistically significant, but the numbers in group AB are too small for sound conclusions.

Table III shows the results of 232 cases of gastric ulcer. These are further analysed in Tables IV and V, the former giving the results of 58 prepyloric ulcers and the latter the results of 171 lesser-curvature ulcers. In the prepyloric group there is an increase of those with group O blood of 18.7% compared with the controls. This is smaller than the corresponding rise in cases of duodenal ulcer, and instead of the fall in group A there is a slight increase. This increase in group O and the

differences in the proportion of group O between duodenal (Table II) and prepyloric ulcers (Table IV) are not statistically significant.

With regard to the lesser-curvature ulcers, there appears to be no change in the percentage of group O compared with the controls, and the slight increase in group A cases is not significant. It is to be noted, however, that not one of the lesser-curve cases came from group B when one would expect 21 patients or 12.36% of the 171 cases. This is most significant, as is the excess of group AB patients ($p < 0.01$).

Where the presence of duodenal and gastric ulceration is found in the same patient—and these comprise no fewer than 126 cases in the present series (Table VI)—

TABLE II.—Blood Groups of 722 Cases of Duodenal Ulcer

	AB		A		B		O	
	+	—	+	—	+	—	+	—
Rhesus	+	—	+	—	+	—	+	—
Men	3	3	185	26	23	3	325	29
Women	4	3	37	3	6	—	68	4
Total	7	6	222	29	29	3	393	33
Total excluding Rh factor	13		251		32		426	
Group frequency	1.80%		34.76%		4.43%		59.00%	
Variation from control ..	—38.1%		—15.8%		—52.1%		+24.7%	

TABLE III.—Blood Groups of 232 Cases of Gastric Ulcer

	Prepyloric				Lesser Curve				Greater Curve			
	AB	A	B	O	AB	A	B	O	AB	A	B	O
Men	—	19	—	16	10	64	—	52	—	—	—	—
Women	3	4	—	16	3	13	—	29	—	3	—	—
Total	3	23	—	32	13	77	—	81	—	3	—	—
% of all G.U. ..	1.3	9.9	—	13.8	5.6	33.2	—	34.9	—	1.3	—	—

TABLE IV.—Variations from Control of 58 Cases of Prepyloric Ulcer

	AB	A	B	O
Numbers	3	23	—	32
% of prepyloric ..	5.2	39.7	—	55.2
Variation from control ..	+78.7%	+3.8%	—	+18.7%

TABLE V.—Variations from Control of 171 Cases of Lesser-curvature Gastric Ulcers

	AB	A	B	O
Numbers	13	77	—	81
% of lesser curvature ..	7.6	45.0	—	47.4
Variation from control ..	+161.2%	+9.1%	—	+0.1%

TABLE VI.—Blood Groups of 126 Cases of Combined Duodenal and Gastric Ulcer

	Prepyloric				Lesser Curve				Greater Curve			
	AB	A	B	O	AB	A	B	O	AB	A	B	O
Men	—	—	—	16	—	17	6	55	—	—	—	6
Women	—	—	—	—	—	7	6	13	—	—	—	—
Total	—	—	—	16	—	24	12	68	—	—	—	6
Percentage	—	—	—	12.7	—	19.0	9.5	54.0	—	—	—	4.8

TABLE VII.—Variations from Control of 104 Cases of Combined Duodenal and Lesser-curvature Gastric Ulcer

	AB	A	B	O
Numbers	—	24	12	68
Percentage	—	23.1	11.5	65.4
Variation from control ..	—	—44.0%	+36.5%	+38.2%

there is an increased percentage of group O over the controls of 38.2% but a decrease of 44.0% in group A if the gastric ulcer is on the lesser curve (Table VII). Both of these findings are statistically significant at the 1% level ($p < 0.01$). It is remarkable and highly significant that all 16 cases of combined duodenal and

Diagram showing the variations from control of blood groups A and O in duodenal, prepyloric, lesser curvature, and combined duodenal and gastric ulceration.

tion to duodenal, prepyloric, and lesser-curvature gastric ulcer.

TABLE VIII.—Blood-group Percentages of the Duodenal Ulcer Patients of Aird *et al.* (1954) and Køster *et al.* (1955) Compared with the Present Series

	A	O
Aird <i>et al.</i> (1954)	34.67	55.4
Køster <i>et al.</i> (1955)	38.4	50.2
Grahame (1960)	34.76	59.0

Table VIII compares the percentages of duodenal ulcer cases in the present series with those of Aird *et al.* (1954) and Køster *et al.* (1955).

Conclusion

There is a significant liability of persons with group O blood to duodenal ulceration and a decreased risk of group A people to this malady.

There would appear to be an increased but not statistically significant risk of group O patients to prepyloric ulceration, but there is not a decreased risk on the part of those with group A blood.

There is no alteration in the risk of group O patients to lesser-curvature gastric ulcer, but there is a small but not significant increase on the part of group A patients. These last findings are the opposite to those of Balme and Jennings (1957), but are in agreement with those of Clarke *et al.* (1955).

There is a remarkably significant decreased risk of group B patients to lesser-curvature gastric ulcer, but the risk to group AB persons is increased.

There is a definitely increased risk on the part of group O patients to combined duodenal and gastric ulceration but a marked decrease in the risk to those with group A blood, and this phenomenon occurs at all three main sites of gastric ulcer.

The risk of group O patients to peptic ulceration diminishes from the duodenum proximally up the stomach, and the risk of group A patients increases, but not to the same extent. Neither of these trends is statistically significant, however; Doll *et al.* (1960), however, showed the same results but did not comment on them.

The decreased risk in group O patients to gastric ulcer compared with the risk to duodenal ulcer does not occur if the patient has already had a duodenal ulcer—in fact, it might increase the risk.

The results support the view that duodenal and gastric ulcers are different diseases except when the two are combined in the same patient. In these circumstances the mechanism may follow the duodenal type.

It is not suggested that all group O patients are liable to duodenal ulcer or that group A patients are protected, because one would expect far greater numbers of peptic ulcer patients than even the most alarming of figures suggest. On the other hand, there could be a hereditary factor at work in some of these patients as one of the causes of ulceration. Again, it must be considered that home and environmental influences may be of greater importance in a family where the patients may be all of one blood group, so that the true hereditary factor may be of minor, if not negligible, proportions.

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“Research in mental health and mental illness remains none the less under the influence of the vicious circle to which reference has often been made in the reports and at the annual meetings of the Fund. Past neglect and the continuing difficulty of the subject, the competing demands both of clinical psychiatric posts and of research posts in other fields, limit the flow of well-qualified research workers to the relatively few places in the country where effective research is being done; and the limitation of these centres where alone training in psychiatric research can be had limits in its turn the flow on which their own expansion depends. Institutions abroad compete for such workers as emerge and offer them in abundance the facilities and the established posts which are so scarce in this country. . . . The position is complicated by the fact that responsibility for State-financed medical research is shared by three different Ministers of State—the Minister for Science, who is now responsible for the Medical Research Council; the Chancellor of the Exchequer, who is responsible for the University Grants Committee; and the Minister of Health, who is responsible for the National Health Service. However good may be the liaison between these Ministers and between the semi-autonomous bodies for which they are answerable, it would be a powerful encouragement both to the profession and to the bodies concerned if the Government, as a contribution to World Mental Health Year, would announce its intention to develop research into mental health and mental illness and to establish an adequate structure of permanent posts to provide a reasonable career for those wishing to devote themselves to research in psychiatry.” (*Annual Report 1959–60*, Mental Health Research Fund.)