ABO Blood Groups and Gastric Ulcer

A. L. MACAFEE

From the Department of Pathology, The Queen's University of Belfast

The finding of Aird, Bentall, Mehigan, and Roberts (1954) that there was a strong association between blood group O and gastric ulcer has been followed by a diversity of results. Many authors, reviewed by Beasley (1960), support the findings, but others found no significant differences between controls and patients with gastric ulcer. The present series adds further support for the association between blood group O and gastric ulcer.

Material

The data were derived from the case records of 325 in-patients who were treated in the Belfast hospitals during an eight-year period 1953 to 1960 inclusive. There were 199 male and 126 female patients. All patients had a laparotomy with gastrectomy and in all the diagnosis of gastric ulcer was confirmed histologically. All patients were residents of Belfast. The ABO blood groups were known for the complete series.

In order to compare the ABO distributions of the patients with suitable controls it was necessary that patients and controls were drawn from the same population. The ABO blood group distribution was known for a large series (11,327) of current blood donors normally resident in the County Borough of Belfast and these were used as controls. The blood donors' distributions have been used to compute the expected

distribution of patients on the hypothesis that patients and controls have similar ABO distributions.

Results

Table I shows the ABO distribution of the patients compared with that expected from the 11,327 controls. There was a significant ($p > 0.05$) difference between the observed and expected distribution ($\chi^2 = 13.445$; $0.01 > p > 0.001$). About 58% of patients were blood group O in contrast to only about 49% of the controls. Consideration of each sex and separate age-group makes no material difference to this conclusion.

Discussion

Woolf's (1955) method has been used to compare and combine these data with some of those from the literature. The result is seen in Table II.

In London, Iowa, and Belfast the estimated incidence of gastric ulcer in persons of blood group O is significantly greater than in those of blood group A. There is no evidence of significant heterogeneity between areas, and estimates of all are validly combined to give an average weighted relative incidence of 1.18. This present series thus adds further support to the published work showing an association between blood group O and gastric ulcer.

Summary

There were 325 patients suffering from histologically proven gastric ulcer who showed a significant excess of blood group O. This present series supports results from other centres.

I wish to acknowledge the help and encouragement of Professor J. H. Biggart who initially suggested the investigation of this problem. I am also very grateful to Professor E. A. Cheeseman for his advice and to Mr J. D. Merrett and Mrs J. McCabe for their help. The physicians and surgeons of the Belfast Hospitals kindly permitted me to examine their case records. I am also grateful to Dr M. C. Huth of the Northern Ireland Blood Transfusion Service who provided the control data.

TABLE I

DISTRIBUTION OF 325 PATIENTS WITH SIMPLE GASTRIC PEPTIC ULCERATION BY ABO BLOOD GROUPS COMPARED WITH EXPECTED DISTRIBUTION FROM CONTROLS

Blood Group	Patients		Controls Percentage
	Total Number	Percentage	
A	109	33.54	37.01
O	187	57.54	48.75
B	24	7.38	10.85
AB	5	1.54	3.39
	325	100.0	100.0

$$\chi^2 = 13.085; \text{d.f.} = 3; 0.01 > p > 0.001.$$

Received April 14, 1964.

TABLE II

GASTRIC ULCER: RELATIVE INCIDENCE IN PERSONS OF GROUP O COMPARED WITH INCIDENCE OF ONE IN PERSONS OF GROUP A

Centre	Total Number of Patients	Relative Incidence O:A	χ^2	Probability
1: London	599	1.27	7.12	0.01 > p > 0.001
2: Manchester	232	1.17	1.22	0.30 > p > 0.20
3: Newcastle	184	1.17	0.96	0.50 > p > 0.30
4: Iowa	469	1.23	4.19	0.05 > p > 0.02
5: Glasgow	300	1.16	1.24	0.30 > p > 0.20
6: Liverpool	377	0.93	0.42	0.70 > p > 0.50
7: Belfast	325	1.30	4.61	0.05 > p > 0.02
Mean weighted relative incidence		1.18		
Total			19.76	
Diff. from unity	d.f. = 1		13.77	p > 0.001
Heterogeneity	d.f. = 6		5.99	0.50 > p > 0.30

Source of material: 1-3: Aird, *et al.* (1954).

4: Buckwalter, Wohlwend, Colter, Tidrick, and Knowler (1956).

5: Brown, Melrose, and Wallace (1956).

6: Clarke, Cowan, Edwards, Howel-Evans, McConnell, Woodrow, and Sheppard (1955).

Controls for 1, 2, 3, and 6: Aird, Lee, and Roberts (1960).

REFERENCES

- Aird, I., Bentall, H. H., Mehigan, J. A., and Roberts, J. A. Fraser (1954). The blood groups in relation to peptic ulceration and carcinoma of colon, rectum, breast, and bronchus. *Brit. med. J.*, **2**, 315.
- , Lee, D. R., and Roberts, J. A. Fraser (1960). ABO blood groups and cancer of oesophagus, cancer of pancreas, and pituitary adenoma. *ibid.*, **1**, 1163.
- Beasley, W. H. (1960). Blood groups of gastric ulcer and carcinoma. *ibid.*, **1**, 1167.
- Brown, D. A. P., Melrose, A. G., and Wallace, J. (1956). The blood groups in peptic ulceration. *ibid.*, **2**, 135.
- Buckwalter, J. A., Wohlwend, E. B., Colter, D. C., Tidrick, R. T., and Knowler, L. A. (1956). Peptic ulceration and ABO blood groups. *J. Amer. med. Ass.*, **162**, 1215.
- Clarke, C. A., Cowan, W. K., Edwards, J. W., Howel-Evans, A. W., McConnell, R. B., Woodrow, J. C., and Sheppard, P. M. (1955). The relationship of the ABO blood groups to duodenal and gastric ulceration. *Brit. med. J.*, **2**, 643.
- Woolf, B. (1955). On estimating the relation between blood group and disease. *Ann. hum. Genet.*, **19**, 251.