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ABO blood group and secretor status in stomal ulcer

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EDITORIAL COMMENT Unfortunately, the differences in blood group secretor status are proving too small to justify taking them into account when selecting patients with duodenal ulcer for different surgical procedures.

When Aird, Bentall, Mehigan, and Roberts (1954) reported that duodenal ulcer patients included an unusually high proportion of persons belonging to blood group O, they provided a new clue to the aetiology of the disease. The validity of their observation has been amply confirmed and the interest in it has been increased by the finding that ulcer patients also included a high proportion of non-secretors, that is, of persons who fail to secrete the ABO antigens (A, B, and H) as part of the gastrointestinal mucus. The association with group O is, however, present to much the same extent, irrespective of the patient's secretor status (Clarke, Evans, McConnell, and Sheppard, 1959; Doll, Drane, and Newell, 1961), and the simple idea that the substances affect the quality of the mucus and its ability to protect the mucosa against ulceration appears not to be true.

One method of further investigation has been to try and define the clinical conditions under which these relationships are most marked. The evidence at present is inconclusive. It suggests (1) that the relationship with blood group O and with non-secretion is stronger in patients with stomal ulcers than in patients with duodenal ulcers (Doll, Swynnerton, and Newell, 1960; Doll *et al.*, 1961); (2) that the relationship with blood group O is stronger in all ulcer patients who have bled (Langman and Doll, 1965); and (3) that the relationship with non-secretion is stronger in all patients who have come to operation (Langman and Doll, 1965).

The amount of data on stomal ulcers is, however, small and the more recent findings in relation to bleeding and to operation suggest that the results may be secondary to the character of the original ulcer. More data on stomal ulcer patients have, therefore, been collected and reviewed in the light of the clinical findings.

MATERIAL

New data on ABO blood group distribution were obtained for 314 stomal ulcer patients. They include all the patients (57) seen at the Central Middlesex Hospital in the period 1959–65 and additional data extracted from patients' records at other hospitals or provided by colleagues. Data for 1,152 duodenal ulcer patients were also obtained from centres for which no duodenal ulcer series comparable with the stomal ulcer series had already been published. They include data on the 192 patients with perforated duodenal ulcers omitted from the series of patients with duodenal ulcer reported previously from the Central Middlesex Hospital (Langman and Doll, 1965). The numbers of patients and a brief description of their character are shown in Table I, together with similar details for 742 patients with stomal and 7,465 patients with duodenal ulcer collected from other reports.

Secretor status was determined for 57 patients who had attended Central Middlesex Hospital with stomal ulcer and for 40 similar patients attending other hospitals in the London region. The Central Middlesex patients include all those known to have attended the hospital during the period 1944–65, apart from 29 who died, 16 who lived too far away to be visited or were untraced, and 75 in whom the secretor status had been determined previously (Doll *et al.*, 1961). The results are compared with those obtained in patients with duodenal ulcer seen at the same hospital, including (1) all those whose secretor status had already been reported, (2) 40 patients

TABLE I

SUMMARY OF PRESENT AND OTHER REPORTED SERIES

	Stomal Ulcer Patients		*Duodenal Ulcer Patients*	
Centre	*No.*	*Description or Reference*	*No.*	*Description or Reference*
New data				
Central Middlesex, London	57	All patients seen 1959–65	192	Patients with perforated ulcer omitted from series reported by Langman and Doll (1965)
Guy's, London	54	In-patients 1950–63		
St. James's, London	49	In-patients 1958–65		
University College, London	18	In-patients 1950–64		
Taplow	21	In-patients 1951–61		
Edinburgh	54	In-patients 1947–57 (Small, W. P., personal communication)	500	In-patients 1947–57 (Small W. P., personal communication)
York	12	Surgical in-patients (Pulvertaft, C. N., personal communication)	460	Surgical in-patients (Pulvertaft, C. N., personal communication)
Copenhagen	49	In-patients (Köster, K. H., personal communication)		
All centres	314		1,152	
Reported previously				
Central Middlesex, London	123	Doll *et al.* (1960)	1,325	Langman and Doll (1965)
Hammersmith, London	11	Roberts, J. A. F. (1957) and personal communication	812	Aird *et al.* (1954) omitting data obtained at the Central Middlesex Hospital in 1953, included by Langman and Doll (1965)
St. James's, London	148	Doll *et al.* (1960)		
St. Mary's, London	19	Doll *et al.* (1960)		
West London	10	Doll *et al.* (1960)		
Glasgow	10	Brown, Melrose, and Wallace (1956)	1,642	Brown *et al.* (1956)
Newcastle	27	Roberts, J. A. F. (1957)	482	Aird *et al.* (1954)
York	36	Doll *et al.* (1960)		
Copenhagen	164	Blegvad (1960) and personal communication	1,903	Jordal (1956), Köster, Sindrup, and Seele (1955)
Iowa (white)	125	Raterman and Buckwalter (1962)	1,301	Buckwalter, Wohlwend, Colter, Tidrick, and Knowler (1956)
All centres	742		7,465	

TABLE II

NUMBERS AND SOURCE OF PATIENTS IN ABH SECRETOR STATUS STUDY

	Stomal Ulcer Patients		*Duodenal Ulcer Patients*	
Centres (London)	*No.*	*Description or Reference*	*No.*	*Description or Reference*
New Data				
Central Middlesex	57	See text	40	Patients with perforated ulcers omitted by Langman and Doll (1965)
			92	Patients seen 1965–66, additional to those previously reported
St. James's	25	See text		
University College	8	See text		
Guy's	4	See text		
Taplow	2	See text		
Hammersmith	1	See text		
All centres	97		132	
Reported Previously				
Central Middlesex	75[1]	Doll *et al.* (1961)	479	Langman and Doll (1965)
St. Mary's	3	Doll *et al.* (1961)		
University College	1	Doll *et al.* (1961)		
All centres	79[1]		479	

[1]Of the series of 83 previously reported, four have been excluded, two because the original ulcer was gastric in site, one because of original combined gastric and duodenal ulcer, and one because the diagnosis of stomal ulcer later proved to be incorrect.

excluded by Langman and Doll (1965) because they had had a perforated ulcer, and (3) 92 patients who had been examined subsequently. Details of these patients are summarized in Table II, together with those for 79 stomal and 479 duodenal ulcer patients reported previously.

RESULTS

The ABO blood distribution of the stomal ulcer patients and of duodenal ulcer patients from the same geographical areas is shown in Table III. For all but one area (Newcastle) the proportions of

group O subjects are higher in the stomal ulcer patients than in the duodenal. The data from all the different areas can be combined by Woolf's (1955) method to give the weighted mean of the relative incidence to duodenal ulcer in each of the blood groups. If group O is compared with the other three groups, the weighted mean is found to be 1·26 to 1, that is, the incidence of stomal ulcer compared to duodenal ulcer is 26% higher in group O than in groups A, B, and AB. The excess incidence in group O is statistically highly significant ($P < 0.001$), and there is no evidence to suggest that the results from the different geographical areas are not homogeneous (Table III).

The stomal ulcer patients, however, differ from the duodenal ulcer patients in at least three ways that may be relevant to the distribution of the blood groups. Stomal ulcer occurs only in patients who have come to surgery, and particularly in those who have had a preceding perforation (Jones and Lang-

TABLE III

DISTRIBUTION OF ABO BLOOD GROUPS WITH STOMAL OR DUODENAL ULCERS

Centre	*No. of Stomal Ulcer Patients in Blood Group*					*No. of Duodenal Patients in Blood Group*				
	O	*A*	*B*	*AB*	*All Groups*	*O*	*A*	*B*	*AB*	*All Groups*
Central Middlesex, London	100	63	12	5	180	840	535	107	35	1,517
Guy's, London	38	13	3	0	54					
Hammersmith, London	9	2	0	0	11	460	263	65	24	812
St. James's, London	115	68	13	1	197					
St. Mary's, London	11	6	2	0	19					
Taplow	14	6	1	0	21					
University College, London	11	7	0	0	18					
West London	7	3	0	0	10					
All London	305	168	31	6	510	1,300	798	172	59	2,329
Edinburgh	40	12	2	0	54	313	154	29	4	500
Glasgow	55	14	5	5	79	947	517	145	33	1,642
Newcastle	16	9	2	0	27	288	157	30	7	482
York	27	18	2	1	48	248	184	22	6	460
Denmark, Copenhagen	125	71	13	4	213	930	740	170	63	1,903
U.S.A., Iowa	68	44	8	5	125	699	472	101	29	1,301
All centres	636	336	63	21	1056	4,725	3,022	669	201	8,617

Mean relative incidence of stomal compared with duodenal ulcer in patients of blood group O compared with those of groups A, B, and AB = 1·26 to 1.

95% confidence limits, 1·10 to 1 and 1·44 to 1.
χ^2 for difference from unity = 11·47, d.f. = 1, $P < 0.001$.
χ^2 for heterogeneity = 5·71, d.f. = 6, P = 0·5.

TABLE IV

DISTRIBUTION OF ABO BLOOD GROUPS IN PATIENTS WITH STOMAL OR DUODENAL ULCERS WITH COMPARABLE CLINICAL HISTORIES IN THE LONDON AREA[1]

Clinical History		*No. of Stomal Ulcer Patients in Blood Group*					*No. of Duodenal Ulcer Patients in Blood Group*				
		O	*A*	*B*	*AB*	*All Groups*	*O*	*A*	*B*	*AB*	*All Groups*
Treated surgically	Pain or obstruction alone	85 (55·9%)	57	8	2	152	343 (53·8%)	230	49	15	637
	Haematemesis or melaena	38 (60·3%)	19	6	0	63	121 (59·9%)	64	14	3	202
	Perforation	50 63·3%)	25	3	1	79	109 (56·8%)	63	14	6	192
No surgery	Pain or obstruction					0	65 (45·5%)	62	11	5	143
	Haematemesis or melaena					0	202 (58·9%)	116	19	6	343
Not known		132 (61·1%)	67	14	3	216	460 (56·1%)	263	65	24	812
All patients		305 (59·8%)	168	31	6	510	1,300 (55·8%)	798	172	59	2,329

[1]Relative incidence of stomal compared with duodenal ulcer in patients of blood group O compared with those of group A, B, and AB, in patients with known clinical history (including surgically treated duodenal ulcer only).

Relative incidence = 1·12 to 1.
95% confidence limits = 0·86 and 1·46.
χ^2 for difference from unity = 0·72, d.f. = I.P = 0·39.
χ^2 for heterogeneity = 0·47, d.f. = 2, P = 0·79.

man, 1966) whereas the duodenal ulcer patients may have included unrepresentative proportions of patients who had bled, because their blood groups may easily be verified retrospectively. A detailed clinical history was, therefore, obtained wherever possible for all patients treated in the London area and the results for such patients are shown in Table IV. The numbers are necessarily much smaller and the difference between blood group O and the other groups in this series may not be statistically significant for this reason alone. It is notable, however, that when in the London area patients with stomal ulcer are compared with those with duodenal ulcer with similar clinical histories the mean relative incidence in group O compared with the remaining groups is reduced (from 1·18 : 1 to 1·12 : 1) and is not statistically significant. The difference between stomal and duodenal ulcer patients shown in Table III may therefore be related to different clinical characteristics of the ulcer groups rather than to any special susceptibility of the group O patients to develop a stomal ulcer. This conclusion must, however, be accepted with caution, for the preponderance of group O subjects in stomal compared with unselected duodenal ulcer patients is less in those from the London area than from elsewhere so that the part of the blood group O excess accounted for by the clinical characteristics of the ulcer may appear unduly large in the London patients.

The distribution of secretor status among stomal and duodenal ulcer patients is shown in Table V. Compared with all duodenal ulcers the incidence of stomal ulcer is higher in non-secretors than in secretors. Stomal ulcer can, however, occur in patients who have already been operated on, and since such patients include an unusually high proportion of non-secretors, the proper comparison is clearly between stomal ulcers and those duodenal ulcers which have come to surgery. When this comparison is made the difference between the two series is much smaller and lies well within the limits of random variations (mean relative incidence 1·14 : 1, P = 0·49).

On this evidence, therefore, there is no reason to suppose that non-secretion specifically predisposes to the development of stomal ulcer.

CONCLUSIONS

The frequency of blood group O and of non-secretion of the ABH blood group substances is greater in stomal ulcer patients than would be expected from their frequency in the large series of patients with duodenal ulcers that have been reported. In the case of non-secretion this difference may well be due to the fact that non-secretion predisposes a patient with a duodenal ulcer to come to operation, and among these patients it may not imply any special susceptibility to the development

TABLE V

DISTRIBUTION OF SECRETOR STATUS IN PATIENTS WITH STOMAL OR DUODENAL ULCER BY ABO BLOOD GROUP IN THE LONDON AREA

Clinical Series	*Hospital*	*No. of Patients in*									*Percentage Non-secretors*
		Group O		*GroupA*		*Group B*		*Group AB*			
		Secretor	*Non-secretor*	*Secretor*	*Non-secretor*	*Secretor*	*Non-secretor*	*Secretor*	*Non-secretor*	*All Groups*	
Stomal ulcer	Central[1] Middlesex	27	15	10	18	0	4	1	0	75	49·3
	Central[2] Middlesex	18	12	14	10	0	3	0	0	57	43·9
	Other London[3] hospitals	17	8	7	5	5	1	0	1	44	34·1
	All hospitals	62	35	31	33	5	8	1	1	176	43·8
Duodenal ulcer, surgical treatment	Central Middlesex	112	68	67	48	15	13	4	7	334	40·7
Duodenal ulcer, no surgery	Central Middlesex	86	52	83	30	14	5	4	3	277	32·5
All duodenal ulcers	Central Middlesex	198	120	150	78	29	18	8	10	611	37·0

Mean relative incidence in non-secretors compared with secretors of stomal ulcer compared with duodenal ulcer treated surgically = 1·14 : 1.
95% confidence limits = 0·79 and 1·66
X^2 for difference from unity = 0·48, d.f. = 1, P = 0·49
heterogeneity = 1·30, d.f. = 1, P = 0·25.

[1]Previously reported (Doll *et al.*, 1961).
[2] New data.
[3]New data with the exception of four patients previously included in the report of Doll *et al.* (1961).

of a stomal ulcer. The situation with regard to blood group O is less clear. The relationship with stomal ulcer may partly be explained by the clinical characteristics of the type of ulcer which comes to operation, but this remains to be proved.

The difference in susceptibility to stomal ulceration in subjects in the various categories of blood group and secretor status are too small to justify taking them into account when selecting patients for any particular type of gastric operation.

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