Coombs test was carried out on infants' cells sensitized in mothers' serum. No other incompatibility was detected.

So far as we are able to analyse the figures, the first period, as shown above, consistently yields a fairly highly significant excess of O in toxæmia, the second period equally consistently yielded no such excess. It may be that there is a phenomenon to explain, but on the present evidence it seems likely that the original finding was due to chance. This experience serves to emphasize the need for large numbers in work in this field, the desirability of demanding a high level of significance before results are taken as more than an indication for further inquiry, and also the desirability of comparing results from different hospitals and different areas.

Summary

A further series does not confirm the finding (Pike and Dickins, 1954) that there is an excess of women of group O among those suffering from toxæmia of pregnancy.

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ABO BLOOD GROUPS AND TOXAEMIA OF PREGNANCY

BY

M. G. PEARSON, M.B., F.R.C.S.Ed., M.R.C.O.G.
Senior Registrar

AND

G. D. PINKER, M.B., M.R.C.O.G.
Late Registrar

Institute of Obstetrics and Gynaecology, University of London

In a study of 541 patients with toxæmia of pregnancy, Pike and Dickins (1954) found a significant excess of women of blood group O as compared with non-toxaemic pregnant women. It was suggested that some of the features of toxæmia might be the result of an antigen-antibody reaction. We thought it would be of interest to repeat their investigation on a similar series of patients admitted to another hospital.

Material

The investigation was carried out on 11,086 consecutive admissions to the maternity department of Hammersmith Hospital between 1949 and 1954.

The majority of patients, both primigravidae and multiparae, are booked for delivery at this hospital in order of their application for admission at the antenatal clinic. Patients attending for the first time in late pregnancy are admitted on obstetrical, medical, or social grounds only.

For the purposes of this investigation and in order to conform with the criteria selected by Pike and Dickins, patients were regarded as having toxæmia of pregnancy if they showed two of the following signs: (1) a blood pressure of 140/90 or over after the 28th week of pregnancy; (2) clinical oedema or an average weight gain of more than 2 lb. (0.9 kg.) a week from the 28th week; (3) albuminuria in a catheter specimen, not due to infection. The level of weight gain which we regarded as significant in the absence of clinical oedema was greater than that selected by Pike and Dickins, but otherwise our criteria were identical with theirs.

Results

The distribution of blood groups in our series of 11,086 cases differed significantly from those of Pike and Dickins (1954), Richardson (1954), and Discombe and Meyer (1952), although the latter three series were compiled in an area

within a few miles of this hospital (Table I). If our series is compared with that of Discombe and Meyer the χ^2 for three degrees of freedom is 18.68.

It is suggested that this difference may be due to the fact that a high proportion of our maternity cases are drawn from the Hammersmith and Shepherd's Bush areas, with the result that approximately 25% of our bookings are Irish women. In Ireland the distribution of the blood groups is such that the ratio of group O to group A and that of group B to group A are higher than in England. Two series of figures illustrating the distribution of blood groups in Ireland—those of Hooper (1947) and Sachs (1940)—are shown in Table II. The expected distribution in a population containing 25% Irish has been calculated, using the figures of Sachs for Ireland and those of Discombe and Meyer for England.

The distribution of groups in toxæmic patients has been compared with that in non-toxaemic patients and the results have been contrasted with those of Pike and Dickins (Table III).

A comparison of our toxæmic and non-toxaemic patients shows there is no significant difference in the distribution of the blood groups (χ^2 for three degrees of freedom is 5.67); comparing the relative proportions of group O and the other groups taken together, χ^2 is 1.30; comparing the proportions of group O and group A, χ^2 is 3.16. A comparison of group B and group AB taken together against group O and group A taken together gives a χ^2 of 1.86. None of these differences is significant.

TABLE I.—Group Frequencies in Totals of Pregnant Women

Group	Present Series		Pike and Dickins		Richardson		Discombe and Meyer	
	No.	%	No.	%	No.	%	No.	%
O	5,105	46.04	1,706	46.73	4,579	45.79	4,578	45.78
A	4,448	40.12	1,545	42.32	4,238	42.38	4,219	42.19
B	1,138	10.26	297	8.13	866	8.66	890	8.90
AB	395	3.56	103	2.82	317	3.17	313	3.13
Total	11,086		3,651		10,000		10,000	

TABLE II.—Percentage Group Frequencies by Nationality in Pregnant Women

Group	Hooper (Ireland)	Sachs (Ireland)	Discombe and Meyer (England)	Distribution Expected with 25% of Irish Women	Present Series
O	54	53.6	45.8	47.7	46.0
A	32	32.4	42.2	39.8	40.0
B	11	11.5	8.9	9.6	10.2
AB	3	2.5	3.1	3.0	3.6

TABLE III.—Group Frequencies in Toxaemic and Non-toxaemic Patients

Group	Present Series				Pike and Dickins			
	Non-toxaemic Patients		Toxaemic Patients		Non-toxaemic Patients		Toxaemic Patients	
	No.	%	No.	%	No.	%	No.	%
O	4,809	46.2	296	43.9	1,416	45.5	290	53.6
A	4,150	39.8	298	44.1	1,342	43.2	203	37.5
B	1,080	10.4	58	8.6	263	8.5	34	6.3
AB	372	3.6	23	3.4	89	2.9	14	2.6
Total	10,411		675		3,110		541	

Discussion

Pike and Dickins, in their series of 541 toxæmic patients, found a significant increase in the proportion of women of blood group O as compared with the non-toxaemic group. They suggested that in some cases certain of the features of toxæmia might be due to an antigen-antibody reaction.

In a similar series of 675 toxæmic patients we have been unable to confirm their findings. We have not found any significant difference in the distribution of blood groups in these cases as compared with non-toxaemic women.

Our incidence of toxæmia was only 6.1%, compared with their 14.8%. We are unable to give a satisfactory explanation of this difference. Our stricter criterion with regard to weight gain has not altered the incidence to any appreciable extent, but our wider selection of women booked for delivery may have contributed significantly to the difference.

With regard to the close association between toxæmia of pregnancy and essential hypertension, it is interesting to note that Maxwell and Maxwell (1955) found no significant alteration in the distribution of the blood groups in the latter condition.

Summary

The distribution of blood groups has been examined in a series of 11,086 pregnant women, 675 of whom developed toxæmia of pregnancy.

There was no significant difference in the distribution of ABO blood groups in the toxæmic as compared with the non-toxæmic group of women.

We are indebted to Dr. Fraser Roberts for help in the statistical analysis, and grateful to Dr. J. V. Dacie for access to the records of the Blood Transfusion Laboratory at Hammersmith Hospital; we also thank Professor J. C. McClure Browne for his advice and encouragement.

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CORTISONE TREATMENT OF THE LOW-SALT SYNDROME

BY

I. G. GRABER, M.D., F.R.C.S.Ed.

PETER BEACONSFIELD, M.D., Ph.D.

AND

OWEN DANIEL, M.B., F.R.C.S.

From the Department of Surgery, Postgraduate Medical
School of London, W.12

After any major surgical procedure there is usually a decrease in the concentration of plasma sodium (Wilkinson *et al.*, 1951). This hyponatraemia can be aggravated by vomiting, diarrhoea, paralytic ileus, or indiscriminate infusion, and can generally be corrected by suitable electrolyte replacement. We have encountered recently five patients who developed a low-sodium syndrome following major surgical procedures and who failed to improve despite what was regarded as adequate replacement therapy. Acting on the supposition that this intractable hyponatraemia was due to transient exhaustion of adrenocortical function, such as is known to occur sometimes in the presence of severe stress (Bland, 1952), we administered cortisone. The results suggest that cortisone therapy is of considerable value in these forms of hyponatraemia, and we report in this paper details of three typical patients. These patients were not the subjects of a planned investigation, and the biochemical data are those obtained during the course of routine management.

Case 1

A man aged 48 was transferred to Hammersmith Hospital because of severe and persistent electrolyte imbalance which had developed following right hemicolectomy, performed six days previously for ileo-caecal intussusception. On each post-operative day he had been given approximately 270 mEq of

sodium and chloride in the form of 3,000 ml. of intravenous fluid consisting of 0.9% (normal) saline alternating with 0.18% saline with dextrose. On admission the patient complained of severe diarrhoea, which had started 24 hours previously.

On examination he was cold, clammy, greatly dehydrated, vasoconstricted, and very restless. To exclude the possibility of a jejuno-colic anastomosis as the cause of the diarrhoea, he was given a capsule containing 200 mg. of indigo carmine, and the dye appeared in his stool six hours later. Blood analysis showed haemoglobin 14.5 g., protein 6.3 mg., and urea 45 mg. per 100 ml. Plasma electrolytes were sodium 114, chloride 83, potassium 3.5, and bicarbonate 37 mEq/l.

He was immediately treated by oral administration of 2 g. of sodium chloride and 1 g. of potassium chloride every four hours, together with half-normal saline by mouth to the amount of 2,500 ml. a day. This regime provided a minimum daily intake of 382.5 mEq of sodium, 463.5 mEq of chloride, and 81 mEq of potassium. His clinical appearance and diarrhoea improved, but there was little change in his plasma chemistry. After four days' treatment plasma sodium was 114, chloride 88, potassium 4.2, and bicarbonate 22 mEq/l.; blood urea was 23 mg. per 100 ml. The 24-hour urine output was 720 ml., containing sodium 14.4, chloride 71, and potassium 24 mEq/l. The volume of the stools at this time was not excessive, and it was believed that the salt balance was positive.

In view of the persistent hyponatraemia and hypochloræmia a course of cortisone acetate, 25 mg. every six hours, was started on the fourth day after admission and the administration of salt by mouth stopped. Twelve hours after starting the cortisone the plasma sodium had increased to 145, chloride to 100, and potassium to 4.5 mEq/l. Urine output during this 12-hour period amounted to 840 ml., containing sodium 50, chloride 71, and potassium 24 mEq/l. Cortisone administration was continued for four days, during which time clinical improvement and normal plasma chemistry were maintained. When the cortisone was stopped the plasma sodium decreased slightly for two days, then returned again to normal levels and the patient made an uneventful recovery. It should be noted that, before cortisone was given, low-plasma sodium and chloride persisted despite a positive salt-and-water balance. Within 12 hours of starting cortisone treatment plasma sodium and chloride returned to normal, although the administration of extra salt had been stopped and the urinary excretion of sodium had nearly quadrupled.

Case 2

A married woman aged 54 was admitted to hospital suffering from jaundice and intermittent hepatic fever. A year previously she had undergone a successful mitral valvulotomy. A week after admission an impacted stone was removed from the ampulla of Vater, cholecystectomy was performed, and a T-tube was inserted in the common duct. The patient received 500 ml. of blood during the operation. During the first week after operation bile drainage varied from 500 to 1,500 ml. a day and contained sodium 140, chloride 118, and potassium 4.4 mEq/l. On the sixth post-operative day plasma sodium was 116, chloride 88, potassium 4, and bicarbonate 24 mEq/l. The 24-hour urine output was 1,200 ml., containing sodium 38, chloride 40, and potassium 115 mEq/l. During this period the patient took about 2,000 ml. of water by mouth every day and a slowly increasing mixed diet, but additional sodium chloride replacement was withheld because of feared cardiac decompensation, except during the first two days, when 1,000 ml. of 0.45% saline with dextrose was given intravenously each 24 hours.

On the seventh, eighth, and ninth days after operation she was given 12 g. of sodium chloride and 6 g. of potassium chloride by mouth in addition to her normal diet. This supplement provided 200 mEq of sodium, 281 mEq of chloride, and 81 mEq of potassium. During the same period 800 ml. of the 1,200 ml. of bile drainage was returned by rectal drip. Clinical improvement was made during these