Anaesthetics

Among the difficulties encountered in dealing with the abnormal case in the house of the patient, and one that has on occasion been a source of anxiety to me, is that of the administration of the anaesthetic. I have always used chloroform. It has the reputation of being safe in midwifery, and I believed this for many years until on one occasion I had, as most of us have had, an unpleasant experience. For many years I gave the anaesthetic and carried out the instrumental delivery myself. Since that time I have made it a rule to secure, if possible, the services of a colleague for the administration of the anaesthetic in any case of difficulty, and it is surprising how an anxious and difficult procedure becomes simplified if you are able to give your undivided attention to the task in hand. In my own area we now do this for each other, frequently without remuneration, and I think that the provision of such services would be an added safety for the patient.

I always apply forceps with the patient in the left lateral position. There is then less trouble with the anaesthetic, and the air passages do not get obstructed. I have not found that cases of disproportion between the size of the foetal head and the pelvis are common. I make it a rule that if the head is not engaged in the pelvis in a primipara by the last month she should have expert advice. We have no difficulty in carrying this out with modern transport at our disposal.

The proper repair of the perineum is a small matter, but of great importance to the ultimate well-being of the patient, and is a procedure which I consider, rightly or wrongly, is done more efficiently on the second day. It is essential to see what you are doing, and if the case has been a difficult one the patient and also the doctor have rested. I make frequent use of bipp as an application to the raw surfaces before stitching the perineum, and I carry in my midwifery bag an "Ever-Ready" battery and head-lamp. This is better than having your hair singed with a candle in a badly lit cottage. I have also found that a safety razor, which takes up very little room in one's bag, is frequently a useful article.

Emergencies

The dire emergency does not, I know, occur often, but it is an ever-present danger. It has occurred in my practice thrice in the last two years. I refer particularly to shock from sudden and severe haemorrhage. The patients in such cases must be dealt with in their own homes, which are frequently most unsuitable. In Newcastle-on-Tyne there has recently been established an emergency service whereby a practitioner, on being confronted with an emergency of this kind, can telephone to the Maternity Hospital and be provided immediately with a specialist, nurse, and all the necessary equipment for combating shock. I believe that in a trial case the emergency staff were in attendance at the house, which was some distance from the hospital by taxi, in fifteen minutes.

I feel that something on similar lines could be arranged in country districts by the local authority. The service could be supplied by the local hospital, and necessary equipment sent by car to any address.

During my long experience I have tried most of the antiseptics that have been fashionable from time to time. I consider that biniodide of mercury is the best for all-round use. I always use it for instruments, and dettol, which I have found satisfactory, for the hands.

In conclusion, I would like to say that in my opinion a great deal of harm is being done and undue alarm created among women by the publicity given to maternal mortality in the Press. In my own area it would be

difficult to better the service provided by the general practitioner. Any improvements in the maternity services of the country generally should be along the following lines:

1. A medical man and a midwife should be engaged for each case.
2. There should be a routine of ante-natal care in each case.
3. Where necessary aseptic equipment should be provided, to include such things as blankets, bedpans, dressings, etc.
4. A midwife or district nurse attending a maternity case should be relieved by a deputy from contact with other cases that are either suspect or septic.
5. Where necessary anaesthetics should be provided at the expense of the local authority. Maternity benefit is insufficient at present to enable the patient to make this extra payment.
6. An emergency service should be established in each area, and also a scheme of expert service available for all conditions at all stages.

HORMONAL REGULATION OF THE NUMBER OF BLOOD PLATELETS IN THE BLOOD

BY

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The constancy of the morphological composition of the peripheral blood picture is subject to nervous as well as to hormonal influences. That the number of erythrocytes is regulated by the thyroid hormone is a well-known fact; the administration of small amounts of thyroid hormone causes an increase in red blood cells in many cases (H. Zondek,¹ Bose,² and others). The increase begins about half an hour after the ingestion of 0.1 to 0.2 gram of thyreoidin, and that this is probably due not to an increased concentration of the blood but rather to an actual increase in the number of red cells in the blood stream can be shown by refractometric examination of the blood.

The following investigations deal with two questions: are the blood platelets also influenced by hormones, and, if so, which are the hormones involved.

Experiments with Thyroid Hormone

Method.—The patients received 0.1 to 0.3 gram of thyreoidin pulv. by mouth. The blood examinations were all carried out at the same time of day. The platelets were counted according to the methods of either Christensen or Fonio. The following tables give some examples of the results obtained.

TABLE I.—Male, aged 37. Diagnosis: Colitis

	Leucocytes	Erythrocytes	Blood Platelets
Before ingestion of 0.2 gram thyreoidin ...	11,000	4,000,000	230,000
½ hour after ingestion ...	10,000	4,000,000	280,000
1 " " " " " " ...	11,000	3,850,000	248,000
2 hours " " " " " " ...	11,200	4,300,000	265,000
4 " " " " " " ...	12,000	4,460,000	240,000
24 " " " " " " ...	14,000	5,000,000	360,000
48 " " " " " " ...	11,000	4,600,000	354,000
72 " " " " " " ...	13,400	4,800,000	221,000

TABLE II.—*Male, aged 30*

	Leucocytes	Erythrocytes	Blood Platelets
Before ingestion of 0.2 gram thyroidin	8,200	3,800,000	228,000
$\frac{1}{2}$ hour after ingestion	7,600	4,380,000	219,000
1 " " " " " "	7,700	4,404,000	235,000
2 hours " " " " "	8,400	4,380,000	273,000
4 " " " " " "	8,500	4,700,000	330,000
24 " " " " " "	7,600	4,300,000	365,000
48 " " " " " "	6,000	4,400,000	320,000
72 " " " " " "	6,800	4,500,000	280,000

TABLE III.—Male, aged 30. Diagnosis: Duodenal Ulcer

	Leucocytes	Erythrocytes	Blood Platelets
Before intravenous injection of 1 mg. thyroxine	6,000	4,450,000	184,800
½ hour after injection	6,200	4,600,000	193,000
1 " " " " " " " " " "	5,400	4,720,000	278,000
2 hours " " " " " " " " " "	6,600	4,800,000	249,000
4 " " " " " " " " " "	4,800	4,400,000	261,000
24 " " " " " " " " " "	4,600	4,600,000	363,000
48 " " " " " " " " " "	7,000	4,480,000	310,000
72 " " " " " " " " " "	7,800	5,080,000	320,000

The results mentioned, which are only a few examples taken from a large number of examinations, show that thyreoidin produces a greater increase in the number of blood platelets than in red blood corpuscles, and that the effect is more regular than in the case of the erythrocytes. We were interested to find in what way thyrotropic hormone would be effective. The following tables will show that the thyrotropic hormone actually causes an increase in blood platelets in the peripheral blood stream, corresponding to the action of thyroxine as described above. The effect of the thyrotropic hormone appears later than that of the thyroid hormone, but lasts much longer.

TABLE IV.—*Male, aged 65*

	Leucocytes	Erythrocytes	Blood Platelets
Before injection of 1 ampoule thyrotropic hormone	7,000	4,420,000	176,000
$\frac{1}{2}$ hour after injection... ..	7,200	4,300,000	225,000
1 " " " " " " " " " " " "	7,200	4,680,000	227,000
2 hours " " " " " " " " " " " "	7,000	4,250,000	184,000
4 " " " " " " " " " " " "	7,800	4,465,000	220,000
24 " " " " " " " " " " " "	7,000	4,500,000	184,000
48 " " " " " " " " " " " "	6,400	5,400,000	320,000
72 " " " " " " " " " " " "	5,800	5,480,000	308,000

TABLE V.—*Female, aged 25*

	Leucocytes	Erythrocytes	Blood Platelets
Before injection of 2 ampoules thyrotropic hormone	11,600	3,800,000	190,000
½ hour after injection...	11,400	4,000,000	220,000
1 " " " " " " " " " "	10,800	4,380,000	215,000
2 hours " " " " " " " " " "	11,000	4,240,000	255,000
4 " " " " " " " " " "	15,200	4,200,000	275,000
24 " " " " " " " " " "	12,400	4,400,000	264,000
48 " " " " " " " " " "	9,800	4,480,000	286,000
72 " " " " " " " " " "	9,800	4,120,000	320,000

TABLE VI.—Male, aged 39

	Leucocytes	Erythrocytes	Blood Platelets
Before injection of 2 ampoules thyrotropic hormone	7,000	4,480,000	270,000
½ hour after injection ...	7,000	4,900,000	318,000
1 " " " ...	6,600	4,400,000	264,000
2 hours " " ...	7,200	4,404,000	255,000
4 " " " ...	8,000	4,400,000	280,000
24 " " " ...	7,600	4,400,000	252,000
48 " " " ...	5,800	5,200,000	360,000
72 " " " ...	6,600	5,000,000	375,000
96 " " " ...	7,000	4,800,000	384,000
120 " " " ...	8,000	3,800,000	323,000

Therapeutic Indications

We saw a case of chronic thrombopenia in a child 8 years of age. There was bleeding from the bladder and the bowels and also petechiae of the skin. The bleeding time was seven minutes; Rumpel-Leede's phenomenon was present. The number of platelets varied between 20,000 and 60,000 per c.mm. The spleen was not enlarged. While the administration of thyroxine was followed only by a short increase of the number of platelets, a pronounced and lasting effect was obtained by injections of thyrotropic hormone. Thus the number of platelets rose to 150,000 per c.mm. and was held at this level under the same treatment for about five weeks.

As no other cases of thrombopenia were available for further examination to prove the effectiveness of the thyrotropic hormone in such a condition we are not able to decide to what extent this treatment may be of general value as a therapeutic measure.

The increase in blood platelets is probably due to specific stimulation of the bone marrow by thyroxine. The following case indicates the probability of this assumption.

A man, 22 years of age, entered the hospital because of acute thrombosis of the splenic vein. He had had enlargement of the spleen and liver for some time. Now he had a very severe anaemia, which was probably due to inhibition of the activity of the bone marrow by the enormous spleen. During his stay in the hospital, ascites, slight jaundice, and haematemesis were observed. The blood picture on December 26th, 1935, was as follows: leucocytes, 2,600 per c.mm.; erythrocytes, 2,670,000; haemoglobin, 45 per cent.: differential count—polymorphonuclear leucocytes, 70 per cent.; lymphocytes, 22 per cent.; eosinophils, 2 per cent.; mononuclears, 6 per cent.

After the intravenous administration of 1/2 mg. thyroxine there was no increase in either blood platelets or in red blood cells as is usually observed. But the effect of adrenal cortex (cortigen), which will be described later, was very marked. Obviously in this case the bone marrow was inhibited to such an extent by the spleen that the thyroxine could not exert its normal influence.

Then we proceeded to investigate the influence of other hormones on the number of platelets (insulin, oestrin, progestin, adrenaline, etc.). No effect was noted from any of these substances, except that the administration of adrenal cortex—cortigen (Richter)—was followed by a pronounced fall in the number of platelets.

Although the diminishing effect was not obtained in all instances we could observe it in the majority of our experiments. Furthermore we were impressed by the fact that the fall in the number of platelets was observed after a regular interval of two hours. We can assume, therefore, that adrenal cortex extract shows a tendency to diminish the number of blood platelets.

Our observations also correspond to those of Shecket, Friedmann, and Nice.³ They reported that adrenalectomized rats showed an increase in blood platelets up to 100 per cent.

TABLE VII

	Leucocytes	Erythrocytes	Blood Platelets
October 29th, 1935, before intramuscular injection of 2 ampoules cortigen	3,800	4,040,000	303,000
$\frac{1}{2}$ hour after injection...	4,000	3,800,000	250,000
1 " " " " " "	3,800	3,500,000	152,000
2 hours " " " " " "	3,500	3,200,000	170,000
4 " " " " " "	3,800	4,400,000	240,000
24 " " " " " "	5,000	3,600,000	350,000
48 " " " " " "	4,000	4,200,000	344,000
72 " " " " " "	4,000	4,200,000	366,000

Summary

The blood platelet count in the peripheral blood is increased by the hormone of the thyroid gland. The action is more constant than in the case of red blood cells. The increase usually appears twenty-four to forty-eight hours after the administration of the hormone and has disappeared within about seventy-two hours. The thyrotropic hormone acts in the same way, but its action is more protracted. In a case of chronic thrombopenia in a child a gradually increasing number of platelets was counted after repeated administration of thyrotropic hormone (single dosage, 500 rabbit units). The hormone of the adrenal cortex showed a diminishing effect on the number of blood platelets in a large number of experiments, but in several other experiments this result was not obtained.

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² Bose, P.: *Klin. Woch.*, 1924, 1367.
³ Shecket, Friedmann, and Nice: *Proc. Soc. Biol.*, 1935, xxxii, 608.

BLOOD TRANSFUSION IN CHILDHOOD*

BY

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I have re-read my paper on this subject of some five years ago, and rather to my surprise find that I still agree with almost all of it. I think anyone else who is interested in it will have the same experience—that is to say, he will agree that blood transfusion has very rapidly reached a stage where it appears destined to remain for some time. Such valuable innovations as the prolonged drip method will of course be introduced, but in this there is no change of principle or widening of the field of application; there is merely an increase in efficiency.

However satisfactory this settling of the status of blood transfusion may be there is another aspect from which the static condition of affairs over the last ten years or so is anything but a matter for the profession to congratulate itself upon. Ten years ago all who knew anything about the subject were convinced that this method of treatment, one of the few which we can say will save lives that otherwise would be certainly lost, was far too little used. Is not the same true to-day? Consider the practice of the profession throughout England. Would anyone claim that more than 10 per cent. of those who would be benefited by a blood transfusion get one? Would anyone like to

estimate coolly the number of lives lost which could have been saved by one? Admittedly the number of transfusions given is increasing, or at least, in the absence of any proper recording of the work of the profession as a whole, we have good reason to think it is. But it is increasing very slowly, and in present conditions it seems to me that it is never likely to reach the optimum figure.

Of course if we think too much along these lines we are apt to fall into one of the last infirmities of mind, whether noble or otherwise—the construction of Utopias. Imagine, for instance, that the medical profession were to reconstruct itself—no, reconstruction is not the word, it has at present no construction whatever—were to design for itself a structure with the sole object of efficiency in the treatment of the sick. Would not one of its first tasks be the covering of the entire country to ensure that anyone could get a blood transfusion with reasonable speed? This would call for specially trained men, not necessarily doing nothing else but (this is the important thing) constantly performing transfusions. It is no good blinking the fact that a blood transfusion is now, and appears likely to remain, a complicated and fairly difficult job. If a man learns how to do his first one from a book and repeats it at the infrequent intervals afforded by any single general practice he will have difficulties and failures that he would not get if properly trained and constantly repeating the operation.

I am assuming in this Utopia that immediately blood transfusion appeared as a method of treatment it would have been investigated under strict scientific conditions; and that as soon as its value had been established its use in appropriate cases would have been incumbent upon every member of the profession without exception. Also that all the results obtained would be tabulated and practice varied as necessary according to what they revealed. And here you see the absurdity of Utopias. This would mean a discipline directed towards efficiency equivalent to that of the crew of a liner; a system of bookkeeping almost as efficient as that in a department store. It is obviously utterly beyond us.

The population would have to be taught that the suggestion of a blood transfusion does not mean that all hope is abandoned, and that the giving of blood does not need dauntless heroism. There are, however, limits to any Utopian's imagination, and getting the lay press to co-operate with us on this and other points is far outside my own.

Then again, if we believe that the injunction "Know thyself" is of any value, a useful thing for the individual to know is his own blood group, a knowledge that may save several vital hours. I suggested, in the paper I have mentioned, that a very useful item of information to be added to religion upon an Army identification disk would be the individual's blood group. I have myself an extremely defective sense of humour, and I have never been able to understand why this suggestion, springing from a certain experience both of transfusion and of recently inflicted wounds, is invariably regarded as a deliberate joke.

Another department of Utopia would deal with the purely technical problems of transfusion. It would therein be an offence to repeat a statement, now sure of universal approval in any medical gathering, that every man will get the best result by using the method he is accustomed to, whichever of the nine and sixty ways that may be. The underlying fallacy would have been discovered upon which this statement rests: the assumption that because all progress springs from variation therefore all variations should be encouraged. The difference would have been recognized between those variations which spring from inability to master the best current practice and those which arise from dissatisfaction with these methods by one who really understands them. In consequence there

* Read in opening a discussion in the Section of Diseases of Children at the Annual Meeting of the British Medical Association, Oxford, 1936.