

ANÆMIA OF A GRAVE CHARACTER OCCURRING DURING PREGNANCY.

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THERE is a form of anæmia that occasionally develops during pregnancy which is not fully described in the text-books and to which the younger members of the profession may not have had their attention sufficiently directed. It is in my experience rather a fatal disease. Its pathology is obscure. It may possibly be simply an exaggeration of ordinary anæmia or of the hydræmia met with in women who are pregnant. If so, it would thus be related to pregnancy much in the same way as pernicious and simple anæmia are to each other. All the problems concerned in the making of blood in health have not been solved. If the physiology of hæmopoiesis is not quite understood, it is scarcely to be expected that much should be known of its pathology. Notwithstanding this, the report of the following cases may not be without interest to the readers of THE LANCET.

CASE 1.—It is now some years since I was first brought into contact with the disease—my early acquaintance with it being through Dr. Russell of Heaton, who had under his care a woman thirty-five years of age, whom I saw a few days after her confinement. She was suffering from extreme anæmia and exhaustion, and was so prostrate that she could scarcely be moved for fear of her fainting. When Dr. Russell was called see her a few days before her confinement grave doubts were raised in his mind as to the possibility of the patient ever going through the processes of labour. She passed through these safely enough, and although at the time she lost very little blood she never rallied, but died a day or two after I saw her.

CASE 2.—A little more than a year ago I saw, with Dr. Andrew Smith of Whickham, a woman aged thirty-two years in the sixth month of pregnancy. She was one of the most anæmic women I have ever seen. Her lips were dry and the face, feet and hands were cedematous. Three years prior to this she had had an attack of pleuro-pneumonia, and although she had made a fairly good recovery it was admitted that she had never quite regained her usual health, there being always a very pronounced degree of pallor present. In my notes I find it stated that she had married seven months previously, that she menstruated once afterwards, and that she was at the time I saw her apparently in the sixth month of pregnancy. There was complaint of vomiting and increasing debility, of dropsy of the extremities and great dyspnœa, of palpitation, fainting and headache, and within the previous two days of bleeding from the nose. She had no appetite. The pupils were semi-dilated, and the pulse was 120, "thready," and "running." The tongue was clean, but the lips were dry and covered with sordes. The lungs were healthy. The heart's apex-beat was felt at the nipple, where a soft systolic murmur was heard, as well as over the pulmonary artery and the aortic orifice. The second sound of the heart was healthy. There was no rise of temperature. The uterus extended about one inch above the umbilicus. Foetal movements could be seen and felt, as well as rhythmic contraction of the uterine wall. A loud placental bruit could be heard. The urine had a specific gravity of 1010, and although albumen was carefully searched for on several occasions none was found. The urine was also free from sugar and blood; urea was present to the extent of 5.6 gr. per ounce. The patient was very ill. It seemed to be impossible that she could live to the end of the normal period of her pregnancy. We carefully discussed the question of the induction of premature labour; but whilst Dr. Smith and I believed that this was her only chance, we were so fully convinced that she would die during the process that we could not recommend the operation. At the time we felt inclined, by means of beef-tea enemata and liquid nourishment, to sustain her strength and fortify her for any eventuality. Five days afterwards Dr. Smith received an urgent message to go to the patient. On his arrival he found her in labour, with the "os" well dilated. I cannot do better than quote almost verbatim his own letter. "I was called on Nov. 23rd at 2 A.M. and found the patient in labour. The os uteri was well dilated. I ruptured the membranes; the head descended at once, and as the patient was

very weak and breathless I put on the forceps and delivered. The child—fully six months developed—was dead and had been so for a few days. I gave ergot, and in a few minutes the placenta was completely expelled. The uterus contracted well. There was practically no bleeding. The patient was extremely exhausted; but after a subcutaneous injection of ether she rallied. The pulse improved, but the breathing was never good. Later in the day it was apparent that she was losing ground; the dyspnœa became aggravated, and, in spite of feeding, stimulants, and rectal injections, she died the same evening, fourteen hours after labour. Under these circumstances I feel sure that the artificial induction of labour would have been more speedily fatal."

CASE 3.—Only a few weeks had elapsed after the death of the patient referred to in Case 2 when I was asked to see in consultation another of a similar character. The patient, however, had been confined. She was twenty-seven years of age and had been delivered of her second child nine weeks previously. There was very marked anæmia. It appeared that she had enjoyed excellent health in the early months of her pregnancy; but towards the end it was observed by her friends that she was losing her colour and becoming extremely pale. Her confinement was an easy one. There was no hitch of any kind, and for a time she seemed to progress satisfactorily, so much so that her medical attendant began to discontinue his visits at the usual time in such a case. Although there was no great hæmorrhage at the time of the confinement there was subsequently a far too excessive secretion of milk—a point of very great importance in the pathology of the disease and explanatory of the anæmia of women suckling infants. Three weeks after the medical attendant had ceased to visit the patient, he was again called to see her. He found her extremely anæmic, with a temperature of 103° F.; there were no rigors or sweatings, but a history of repeated vomiting and extreme constipation. It was considered advisable to arrest the galactorrhœa and to give the patient iron. No improvement, however, followed. On the day of my visit her temperature was 101°, there was a feeling of syncope, the vomiting had ceased, the pulse was 110, and the tongue was moist. There was a well-marked venous hum heard in the neck; a systolic murmur could be heard over the pulmonary artery and the aortic and mitral areas. The lungs were healthy. The liver presented nothing remarkable and the area of splenic dulness was slightly increased. Per vaginam the uterus was found to be healthy and involuted; in the cul-de-sacs nothing could be felt, there was no inflammatory deposit. The urine was not albuminous. The rectum was loaded with hardened scybala. There was no cedema of the feet. She was ordered enemata, so as to have the bowel thoroughly washed out; cascara and albuminate of iron were also given. For a few days after this the patient seemed to improve, but she gradually relapsed, the anæmia becoming more profound, and she died fourteen days after our consultation.

Remarks.—That the blood undergoes certain alterations during pregnancy is a fact that has been long placed beyond dispute. It is several years now since attention was directed to the plethora of pregnancy. The enlarging uterus with its widening vessels and the increased functional activity of the maternal organism, especially in the later months of utero-gestation, necessitate an augmentation in the volume of the blood, particularly if the utero-placental vessels are to be filled without the other organs becoming anæmic. Drs. Spiegelberg and Gschleiden have demonstrated this increase in the volume of blood in dogs during the latter months of pregnancy. A similar change occurs in women. With an increase in the volume of the blood there is marked impoverishment of its quality. There is a noticeable reduction in the number of red corpuscles with a diminution of albumen; whilst the white corpuscles are increased, as also is the amount of water, for the serum is found to be deficient in solids. There is, therefore, hydræmia as well as plethora. Under all circumstances, but particularly in pregnancy, it is an easy transition from the physiological to the pathological. A large number of girls who are the subjects of chloro-anæmia fail to become mothers after marriage. In those who conceive, the early months of pregnancy are not necessarily characterised by the presence of more serious symptoms than are met with, under similar circumstances, in their healthier sisters. It is in the later months of pregnancy that symptoms become more pronounced, especially if the appetite fails. Even then the pregnancy may go to term, and the act of parturition be accomplished

without any unusual loss of blood. The convalescence of a chloro-anæmic mother is at times apt to be tedious, for the blood has to undergo a process of involution just as the uterus does. Faults in the blood antecedent to and during pregnancy do not favour an early return to health. Some writers maintain that in anæmic women the separation of the placenta is accompanied by a severe loss of blood. Such is not my experience; it certainly is not borne out by what occurred in the three cases above detailed. In the second case, which I have reported at length, a brief history of the disease I am describing is given. The patient was anæmic, to begin with. She passed through the early months of pregnancy fairly well, but all the time an anæmia was developing, which ultimately became so profound that the friends of the patient were struck by her extreme pallor. In addition, there was repeated vomiting, the patient complaining of great breathlessness, syncope, and exhaustion. The symptoms tend to become aggravated as the pregnancy advances. They thus give a serious character to the illness, which is frequently fatal. Dr. Spiegelberg¹ says that of twenty-five cases collected by Graefe almost all died, most of them rapidly and very shortly after labour; only one patient was cured, and two are spoken of as having improved. I am inclined to regard this disease as being something more than ordinary anæmia or the simple hydræmia of pregnancy. How far it resembles pernicious anæmia I am not prepared to say. As the cases occurred in the country I had no means of examining the blood microscopically. Their pathology is obscure. The blood-forming organs were apparently at fault. There seemed to be deficient formation rather than increased disintegration of red corpuscles.

The source from which the hæmoglobin of the blood obtains its iron is one of the recondite problems of physiology. Fresh interest in this question has been aroused by the researches of Bunge and the recent Goulstonian lectures of Dr. Halliburton. In his "Physiology and Pathological Chemistry" Bunge, quoting from Schmidt, says that in human blood there is 0.051 per cent. of iron—this being almost exclusively in the form of hæmoglobin—and that the quantity of iron in the blood of an average man is about thirty-five grains. From where does the hæmoglobin obtain its iron? The food of most vertebrates contains no hæmoglobin, and it is completely absent in the food of herbivora. Carnivora living upon vertebrates are the only animals that introduce hæmoglobin into their alimentary canals. Even under these circumstances the hæmoglobin is not formed from that which is present in the food, for the hæmoglobin of animal tissues is disintegrated in the alimentary canal through the action of digestive ferments, the iron separating as hæmatin and coming away as such in the fæces. It is unlikely, therefore, that the hæmoglobin in animal food is the source of that which is met with in blood. Bunge is just as sceptical in regard to the inorganic salts of iron being considered as a source, although it is admitted that they are administered freely in anæmia, and with benefit. It was formerly believed that hæmoglobin might be formed by synthesis from an iron salt and albumen. Bunge is not only opposed to this opinion, but states that he has grave doubts as to whether iron, as such, is absorbed at all. He believes that, owing to the action of sulphur compounds and of other reducing agents in the intestine, the compounds of iron are converted into sulphide of iron and eliminated with the fæces, and that all compounds of iron, including the albuminates, meet with this fate. According to Bunge it is neither from animal food nor from the inorganic salts of iron that the hæmoglobin of our blood obtains its colouring matter. Another source must therefore be looked to for it. Are there any precursors of hæmoglobin? Yolk of egg contains no hæmoglobin, but it must contain a precursor of it, for when the egg is hatched hæmoglobin is abundantly present in the blood of the chick. This, therefore, is one source. The blood of the newly born child contains hæmoglobin, which it could only have obtained from its parent, and in the milk of the mother there are to be found all the materials requisite to feed the growing child and maintain a healthy condition of its blood. Chemical examination shows that the iron in the yolk of egg is in the form of nucleo-albumen. If this is the storehouse from which the blood of the chick draws its hæmoglobin, so must the blood of the pregnant woman be the source of the iron for the foetus in utero. The ash of the newly born animal contains iron far in excess of that met with in the adult. It is estimated that there is six

times more iron in the ash of a puppy than in the milk of the mother which feeds it. The young animal, therefore, acquires the store of iron necessary for its growth before its birth through the placenta, and after birth through the milk of its mother.

Given the case of an anæmic woman becoming pregnant and who is unable to make even sufficient hæmoglobin for herself, how great must be the demands made upon her blood-forming organs as time goes on. In the early months of pregnancy hardly any demand is made, and consequently at that time nothing arises to create anxiety, for the placental circulation has not been established; but as each month passes the mother keeps giving to the foetus by this channel increasing quantities of iron to form its hæmoglobin. There is therefore a drain upon the mother which her reserve powers can scarcely meet. It is thus rather than by a disintegration of red blood-corpuscles that I seek to explain the development of this grave form of anæmia during pregnancy: it is the giving away of iron by the maternal organism to the growing infant in utero. Spread, as this process is, over a period of months and with a drain increasing as time goes on, this is met in the healthy woman by increased appetite and by improved blood-forming powers; but in the anæmic woman there is enfeebled ability on her part to form hæmoglobin, and, when to this is added the hydræmia that is gradually developing, an explanation is found of the serious nature of this form of anæmia in pregnancy. All my cases proved fatal, in spite of the most careful treatment and attention.

The remark which I have already made in regard to the presence of a large quantity of iron in the milk of the suckling woman will explain the relationship of anæmia and galactorrhagia. Regarding pregnancy as a cause of this form of anæmia, the question of the induction of premature labour naturally suggests itself. In Case 2 it was most carefully discussed by Dr. Smith and myself. On the one hand, it was only too apparent that the patient could not live until the normal termination of her pregnancy; and, on the other, it was just as clear that, whilst in the induction of premature labour lay the hope of saving her, the strength and general condition of the woman were such as to arouse in our minds the gravest doubts as to the successful issue of the case. We found ourselves placed in a most embarrassing position. The induction of premature labour was called for, and, much as this is admitted to be in such cases a necessary and justifiable line of treatment, it was in our patient neither possible nor practicable. Transfusion of blood would in all probability not have given any better result—it was then too late; besides, cases in which it has been tried have shared a similar fate to my own.

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THE RELATION OF DUST IN HOSPITALS TO TUBERCULOUS INFECTION.

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DURING the last winter we carried out a series of inoculation experiments with a view to testing the power of certain substances to carry tuberculous infection. The material used was of such a kind, and was taken from such places, that one might with fairness say it would be capable of conveying tuberculous infection. We were anxious to test this question for two reasons: (1) because recent work, the results of which have been published, leads one to suppose that substances (and more particularly dust) which have been in more or less direct contact with tuberculous persons are in no slight degree factors in the causation and spread of tuberculosis: and (2) because this being so, we wished to ascertain whether or not the placing of tuberculous individuals under antiseptic rules as to the disposal of their expectoration and other tuberculous discharges minimised the chance of infection from dust and other material which had been in contact with tuberculous patients. The substances

¹ Trans. ti ns of the New Sydenham Soc'ety, vol. cxix., p. 339.