CRITICAL REVIEW.

Hyperemesis Gravidarum.

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Hyperemesis gravidarum, or pernicious vomiting of pregnancy, has long been recognised as a most serious condition, not especially uncommon, and so frequently attended by fatal results as to make it always a matter for serious discussion. Previous to the essay by Anquetin in 1865, there is not much in the literature which is of interest in the light of modern research, and it must be noted that the older writers were not sufficiently careful to exclude cases of pernicious vomiting *in* pregnant women, caused by some intercurrent disease. Graily Hewitt, in an important monograph published in 1891, gave a tabulated account of 24 fatal cases, in which some disease running concurrently with pregnancy, was the cause of death through persistent vomiting. Pregnancy alone could not be considered to be the cause of death, in these cases. Later writers, especially, lay down the axiom that true hyperemesis gravidarum must be caused by pregnancy alone, in some way, and not have any relation to an intercurrent disease. It is clear that such conditions as cancer of the pylorus, tubercle of the brain, hernia, acute yellow atrophy of the liver etc., are quite sufficient causes in pregnant women for pernicious vomiting and progressive wasting; they may, however, be aggravated by the presence of pregnancy. In this article therefore the writer will be concerned with cases in which the vomiting was apparently caused by pregnancy alone. Considering the subject as a whole, causation is perhaps the most interesting, although the clinical aspect including treatment, can hardly be considered as much less worthy of consideration.

Causation.

From a study of the literature of the subject it is clear that the common theories of causation may be grouped under four headings, namely:—

(1) Hyperemesis gravidarum, a reflex act due to some actual lesion of the pregnant uterus or pelvic organs, such as displacements and incarceration, rigidity of cervix, erosions of cervix, endometritis

and metritis, unusual stretching of uterus, adhesions between uterus and other parts.

(2) A functional neurosis of the central nervous system, viz., hysteria.

(3) A reflex stomach neurosis.

(4) An auto-intoxication, either from the alimentary tract, from the ovum itself, or from a bacterial infection.

1. *A Reflex Act from a Pelvic Lesion.* This was the theory most favoured by earlier writers, and one which no doubt even now carries weight with it. Graily Hewitt, in his monograph, points out that the majority of the then published cases, had some local lesion of the pelvic organs associated with the excessive vomiting, amongst which were marked flexions forward or backward, rigidity of the cervical tissues, and impaction of the body of the uterus in the pelvis. From this Hewitt concluded that hyperemesis was a reflex act, or neurosis, started by unusual impulses from the uterus. Of all the lesions to which this condition had been ascribed, Hewitt believed that impaction of an anteflexed gravid uterus was the most important. He admitted that retroflexion had been considered to be a cause, and also that minor cervical lesions occasionally seemed to be causes, but until Hewitt's papers appeared, little attention had been paid to the possibility of impaction of an anteflexed uterus being a cause of excessive vomiting. Indeed, when Hewitt first brought forward this view it was believed, and no doubt is still believed by many, that it is not possible for an anteflexed gravid uterus to become impacted in the pelvis. Hewitt brought forward a series of cases showing that elevation of an anteflexed gravid uterus, and its retention in a normal position, had apparently acted as a cure in 12 out of 13 cases. At the same time, he quoted a similar number of cases of retroflexion of the gravid uterus with excessive vomiting, in which replacement effected a cure in 12. At first sight the cases seem convincing in favour of Hewitt's views, and adherents will never be wanting to draw a deduction from what appears to be cause and effect. However, Kaltenbach and other recent writers would consider that the mere performance of so small an operation as elevating a displaced gravid uterus acts, not so much by directly removing the cause in producing a cure of vomiting, but by "suggestion," on the hypothesis that hysteria is really at the bottom of the condition. Hewitt touches on the question of metritis and minor cervical lesions as possible causes of excessive vomiting, and quotes Pugliatti's views. The latter considers that it is the pressure on the sympathetic nerves of the neck of the uterus, caused by a retention of secretion in the

cervical glands, which starts the reflex act. Hewitt considers that anteflexion might well be the cause of such retention of secretions, and suggests that the passage of a wool-coated probe (Pugliatti) to remove secretions, may really relieve pressure by correcting a flexion. It is interesting to note that Spiegelberg expressed much the same opinion in 1877, viz., that anteflexions with impaction were found in quite a large number of cases of hyperemesis. Hewitt, however, anticipated him, as his (Hewitt's) first paper on the subject was published in 1871. If Hewitt's views are universally true, it would be expected that every incarcerated gravid uterus would be associated with hyperemesis, but this is far from being the case. It will be seen, too, that in the light of more recent views, it may be unnecessary even to correct a displaced uterus, if other suitable treatment be applied. Hewitt's views may be taken as typical of the very numerous writers, who have published apparent cures of hyperemesis by the treatment of some essentially trivial local pelvic lesion.

2. *A Functional Neurosis of the Brain or Hysteria.* Kaltenbach is the chief exponent of the view that hysteria is the principal cause of hyperemesis. He said in an address at Berlin "the extraordinary and unforeseen course often run by hyperemesis gravidarum, and the fact that it often suddenly ceases without any psychical or physical treatment, says much for the hysterical nature of the condition." The sudden cessation occurs much in the same way that hysterical paralysis often disappears. The diagnosis in some cases is easy if the usual stigmata of hysteria are present, *e.g.*, absence of the palatal and corneal reflexes, localised skin anæsthesia, hemianæsthesia, hyperæsthetic areas, "ovarian pain," and increased patellar reflexes. Nevertheless, as Eulenburg has shown, these symptoms may be absent and yet the case may be one of true hysteria. But the diagnosis of hysteria is by no means easy if these stigmata are absent. Graefe, who is an upholder of Kaltenbach's views, places great importance on the fact that primiparæ suffer more from vomiting than multiparæ, and believes that in many, vomiting first commences when such women realise that vomiting is expected of them, and also that an unwelcome conception may be a cause of a functional neurosis. Pick's cases, 23 in number, are quoted by Graefe as bearing out Kaltenbach's views, and Pick himself inclines to the same opinion, although he argues that no one hypothesis will fit all cases. Among these cases of Pick's is the very interesting one quoted by Behm as upholding his views concerning his syncytial intoxication theory. This, however, Graefe considers is not the case, but holds that it really helps Kaltenbach's theory. The

patient was a woman, who had an incomplete abortion with serious vomiting, and never ceased to vomit until immediately after the clearing out of the *débris* of conception products. Behm says that the retained syncytium continued to produce the toxin considered by him to be the cause of vomiting, and that this only ceased when all syncytium was removed. Graefe, however, denies this, and says that the patient believed herself pregnant after her incomplete abortion, and continued to vomit until she was assured that she was no longer pregnant, all the products of conception having been removed. This, Graefe contends, is an instance of cure by "suggestion" and not by the removal of syncytial toxins. In the same way Graefe contends that if Behm's views were correct many patients with retained products of conception would continue to have vomiting, but this is absolutely not the case. Graefe quotes several other cases in Pick's series, all of which, according to his opinion, go to uphold Kaltenbach's theory; in some of these a cure was effected by removal from home and rest in bed; in one, although the vomiting ceased after replacement of a retroflexed gravid uterus, Graefe contends that the result was due to "suggestion" rather than the replacement, because the retroflexion recurred later and yet there was no more vomiting. In one of these cases only was the treatment adopted unsuccessful, and vomiting ceased only after abortion had been produced. Two cases ended fatally, but the autopsy showed that in each a septic endometritis was the cause of death, and in each the vomiting had ceased after removal to hospital. Finally, Graefe quotes a case of his own, in which vomiting was so severe that an attempt was made to produce abortion by the introduction of a sound. This, however, failed, and yet the vomiting ceased at once. This was a most serious case, and the patient also suffered from hysterical paralysis.

3. *The Reflex Stomach Neurosis Theory.* The upholders of this theory seem to make out, perhaps, the poorest case of all. Schäffer holds that neuroses appear in certain anæmic and chlorotic individuals as soon as menstruation (a periodical), or pregnancy (a lasting), blood flux to the genital organs appears. In the genital organs themselves congestion, blood stasis, and their sequelæ—metritis, flexions and ovarian changes, call forth simple, frequent, and lasting reflexes. In the same way hydramnios, twins and hydatid mole, produce reflexes which are carried not only by the pudic nerves, but also by the plexus utero-vaginalis and the spermatic nerves. These views are by no means convincing, for hyperemesis occurs sometimes in strong full-blooded persons, and is often absent in anæmic and

chlorotic individuals. Evans holds that nausea and vomiting are of a rhythmical character, and are therefore to be explained by the rhythmical contractions of the uterus in pregnancy, setting up a reflex neurosis. Moody considers that the growing uterus has an effect in causing a reflex neurosis by pressure on the *ganglion cervicale uteri*, and Barth similarly on the sympathetic nerves. Geoffroy holds that hyperemesis is due to a reflex contraction of some part of the intestinal tract, either at the pylorus, duodenum or the ileo-cæcal angle. Painful contractions at these points are set up by hyperæsthesia of the bowel, and result in retention of gases and liquids. He points out that in hyperemesis, such gaseous and liquid collections may be palpated, and believes that massage is indicated for their removal, and for cure of the vomiting. We must carefully distinguish between these views that hyperemesis is a reflex neurosis, rather than the simple reflex act which the older writers placed their faith in; the latter being dependent on many conditions of the pelvic organs, the former being independent of pelvic lesions, and produced simply by pressure or irritation of the pelvic nerves. In this respect Tuzkai's views rather correspond with the reflex neurosis theory, than with the simple reflex act theory. He holds that the essential cause lies in the abnormal stretching of the pelvic peritoneum as the gravid uterus enlarges.

4. *The intoxication Theory.* One view of this theory is upheld by Dirmoser and many others, another by Behm. The former look upon hyperemesis as an auto-intoxication due to poisons largely generated in the alimentary canal; the latter refers it to poisons generated in the growing ovum itself, especially in the syncytium. Dirmoser holds that, in certain persons in whom the nervous irritability is easily increased, the growing uterus gives rise to impulses which travel by way of the vagus and sympathetic to the stomach and intestines. The nerve impulses cause increased flow of mucus from the stomach and intestine, and so the normal reactions are interfered with. As a result, this great increase of fluid predisposes to the formation of toxins which, becoming absorbed, cause excessive vomiting. He brought forward a case in which toxins, which killed animals in about three hours, were found in the intestines. He also reports the results of urinary analyses in which he found urobilin, blood pigments, albumen, acetone, peptone, oxalic acid, indol, skatol; hyaline, granular and fatty casts, and triple phosphates. He points out the analogy in these findings, with those of infectious and other toxæmic conditions. The results of these poisonous substances no doubt show themselves, by injurious effects

on the liver and kidneys, just as such toxic substances do in other conditions like eclampsia. These observations are by no means novel, for some such changes in the liver and kidneys were reported by Matthews Duncan, although he considered them to be primary, and looked upon them as the essential cause of hyperemesis in his case. We now clearly recognise that such visceral changes are in most instances secondary to toxic conditions. These views seem to be more convincing than either the hysteria or reflex neurosis theories, and there is very little doubt that the really serious cases of hyperemesis will be found to come into this group. Those cases which seem to have some pelvic lesion as a causal agent, are rarely so serious as those considered by Dirmoser and his followers. If these cases were really connected with an auto-intoxication, it is difficult to see how the cure of a simple local lesion would have any effect on the pernicious vomiting.

Behm's view that the disease is an intoxication from absorption of syncytial toxins, seems to be a very alluring, but at the same time a somewhat unnecessary, hypothesis. Behm believes that it is the disintegration of chorionic villi in the early months of pregnancy, with the subsequent absorption of their *débris* into the blood stream, which is the source of the toxic substances producing hyperemesis. He holds that the disintegration of villi is practically complete in the middle period of pregnancy, and that this is the time when excessive vomiting commonly ceases. He suggests, too, that an immunity is produced during these proceedings, and thereby explains the fact that multiparous women do not suffer from vomiting as primiparæ do. The greater the interval between succeeding pregnancies the less becomes the immunity. That there may be some truth in this view, is somewhat upheld by the paper by Veit, who showed that deportation of villi from a growing ovum through the circulation was possible, and could be demonstrated. The views of Behm and Dirmoser have been hotly contested by many, especially by the followers of Kaltenbach. The latter contend that if hyperemesis is caused by an auto-intoxication, how could so simple a method of treatment as "suggestion" effect a cure? Eclampsia has never been successfully treated by "suggestion," and Pick inquires how is it, if Behm and Dirmoser are correct, that in so many cases the vomiting ceases immediately after abortion, when the toxins cannot yet have been eliminated from the body? As an interesting addendum to the intoxication theories, Fischel's view that hyperemesis is really an infectious disease, caused by a micro-organism, must be mentioned. He bases his contention on the occurrence of hyperemesis in two pregnant women, living in the same house at the same time.

Baisch, in a recent paper, points out that there are two facts which stand out strongly in connection with hyperemesis gravidarum:

1. That hyperemesis is clearly connected with the embedding of the ovum in the uterine wall, seeing that it occurs most commonly in that period of pregnancy connected with placental development.

2. There is no essential difference between hyperemesis and simple vomiting of pregnancy. The latter slowly increases and passes into the former, without any special cause being present.

Unfortunately we have no adequate idea of the causation of simple vomiting of pregnancy, although the theories advanced for hyperemesis must in a way be applicable to simple vomiting. The effects on the maternal organism called forth by pregnancy are very great, as may be seen in the growth of breast tissue and secretion of milk. The effect on the stomach, too, is great, and is often shown by increased secretion, and ravenous hunger. If the maternal organism is equal to this great strain, then pregnancy is a physiological process. In many women, however, the organisation is not equal to the strain, and so hyperemesis may be one of the results. Baisch agrees that the nature of the irritation which affects the nervous system, seems to be intimately connected with some chemical poison set free by the growth of the villi. In this respect his views approximate to those of Behm, Veit and Liepmann. Thus far the intoxication theory has something convincing in it, but it must be remembered than many women never vomit at all, and, in most, the vomiting keeps within physiological limits. If hyperemesis is a reflex disturbance of the stomach function set up by the growing ovum then it may be started by some disturbance in a part of the reflex arc, either:—

1. At the source of the irritation—the villi.
2. At the medullary centres.
3. At the periphery, namely, the stomach.

According to the first view, we see that hyperemesis is more common in twins (Flaischlen, Lapeyre, Kiessler, Pick) or with hydramnios and hydatid mole (Williamson and Doran).

In the second category we must look for some alteration of the nerve centres by which the reflex excitability is greatly increased; in this respect Baisch agrees that hysteria (Kaltenbach, Graefe, etc.), and general nervous excitement (Ahlfeld), may play a part. In the third category we have to deal with real obvious lesions of the stomach, such as catarrh, ulcer, carcinoma, etc., which, according to many authors, do not come under the heading of hyperemesis gravidarum at all. At the same time, it may be admitted that a

previous stomach lesion may be adversely affected by pregnancy, and so exacerbations of symptoms may occur. Baisch's views, thus set forward, put no fresh conceptions before us, but at the same time they help to reconcile the various theories mentioned, and show what has been said by many observers, that no one view will fit all cases, and that each must be judged on its own merits.

TREATMENT.

Where such differences of opinion as to causation exist, it is only to be expected that the means of treatment resorted to will be multitudinous. As all cases have not the same cause, so all cannot be treated alike. It is impossible, therefore, to adequately review all the methods of treatment which have been suggested; only those which are applicable to the theories of causation mentioned will be touched upon. In view of the large number of cases published in which some simple local lesion has been treated, and cure has resulted, it is necessary always to make a careful examination so that no local lesion should be overlooked or remain untreated. In this way displacements must be reduced, and the gravid uterus kept in position by suitable means. Hewitt places great faith in the air-ball pessary as a means of elevating an incarcerated uterus. Postural treatment in bed will also do much to correct such displacements. A marked erosion of the cervix is best treated by local cauterisation, or cauterisation after removal with a sharp spoon of any thickened mucous membrane. As a purely empirical method of treatment, that of Copeman may be mentioned here. He found, accidentally, that vomiting ceased in a case in which he had tried to dilate the cervix with the finger at the sixth month of pregnancy, in order to be able to rupture the membranes. Failing to do so it was found, on waiting, that sickness seemed to have ceased and so nothing further was done. This procedure was afterwards deliberately carried out by Copeman and others, the cervix being dilated either by the finger, or metallic dilators, until the internal os was opened up. This treatment was followed by a considerable measure of success, and has been regarded as a most important means of treating some of these cases. It must not be forgotten that there will always be a danger of producing abortion by this means, and it is a fact that it has sometimes failed to produce the desired effect. The upholders of the hysteria theory consider that removal of the patient from friends, rectal feeding and "suggestion," either in the form of hypnotism or some trivial local treatment, will give the best measure of success. On the other hand if an auto-intoxication be considered to be the cause of the disease

treatment directed to the alimentary tract is indicated. Dirmoser advocates washing out the stomach with either a solution of carbonate of soda or boracic acid; saline rectal injections, and rectal feeding. Behm goes further and recommends thoroughly washing out the colon by large enemata; three to five litres of salt solution, with opium if necessary, being slowly injected and retained. This, no doubt, has the effect of promoting diuresis, and diluting toxins in the blood. If feeding cannot be carried out by the mouth, Behm recommends the addition of milk to the rectal injection. Galvanism of the vagus nerve has been recommended, and carried out, with some success by Bordier and Vernay, Auvard and Daniel. These observers used 10 milliampères increased to 15 and 30, placing the negative pole on the epigastrium and the positive pole on the space between the two heads of the sternomastoid muscle. No doubt the followers of Kaltenbach would consider good results from this treatment as arising from "suggestion." No drug can be mentioned which can be relied upon to do any good in really serious cases. The much-lauded oxalate of cerium, and orexin, can only be expected to produce results in mild cases. Failing improvement by any of these means, most observers are agreed that the question of artificial production of abortion must be raised, and all are agreed that it is important not to wait too long before carrying it out. There are many cases on record where abortion has been induced too late, and the patient has died in spite of it, although the vomiting may have ceased. According to Tuzkai the indications for artificial abortion are: inanition leading to rapid diminution of the body weight; increased specific gravity of the urine; alkalinity of the blood, and frequency of pulse; albumen and casts in urine, with normoblasts or megaloblasts in the blood.

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