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Original Articles

THE TREATMENT OF ECLAMPSIA*

METHODS USED AT THE TORONTO WESTERN HOSPITAL
OBSTETRICAL DEPARTMENT. EIGHT CONSECUTIVE
CASES WITHOUT MATERNAL DEATH.

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Mr. Chairman, Ladies and Gentlemen:—

Eclampsia is such a serious disease, and its manifestations are often so sudden and appalling, that I feel a very short review of some of the outstanding features of this pathological condition, and of its rational treatment from a practical standpoint, may be of service.

May I briefly mention some of the salient points about the disease that will help us to better understand the principles of treatment?

Definition.—Eclampsia is an acute toxemia occurring in pregnant, parturient and puerperal women. Jardine says it may also occur in the new-born children of these women.

The disease is generally manifested by tonic and clonic convulsions with loss of consciousness, frequently followed by coma. Convulsions are not always present.

Frequency.—It occurs in about 1 per cent. of women entering lying-in hospitals, but is subject to wide variations in different years, and in different institutions.

It is more frequent during the cold, changeable weather, and, to a certain extent, follows the incidence of acute nephritis due to climatic conditions. I might venture to suggest that certain epidemic diseases affecting the kidneys, such as scarlet

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fever, may affect a large number of girls at the same time and injure their kidneys. Years later when these girls marry and become pregnant, they form a group that is more easily affected by the toxemias of pregnancy, and thus give rise to a wave of eclampsia.

Most cases of eclampsia are in primiparae, 80% according to large statistics (Jellett). All the cases I have had in the Western Hospital have been among primiparae. The last three months of pregnancy have the largest number of cases. The disease increases in frequency the nearer term is approached.

Mortality.—Taking the country as a whole, about 25% of the women die. The fetal death rate is very high. It goes over 50%. In our series, in all the cases that had convulsions before admittance to the hospital the fetuses were already dead when the women came under our care. In the post-partum case the child was saved and showed no evidence of the disease.

Etiology.—This condition has been called the "Disease of Theories." I have no knowledge of the chemical composition of the poison which we suppose exists. May I mention in passing a few of the theories that have held sway from time to time.

Predisposing causes are to be found in acute and chronic nephritis, in primiparity, a neurotic temperament, in the long retention of waste products, excessive size of the uterus from hydramnios or multiple pregnancy, or obstructed delivery (Jellett).

Frerich's urea theory, the uremic theory, the auto-intoxication, the infectious theory, the neurotic, the ovular, the anaphylactic and thyroid theories, all have their exponents and opponents. It seems to me that the poison is elaborated in the placenta and gets into the blood stream easily, and is carried throughout the body, affecting the liver, kidneys, brain and heart especially, and in proportion to the concentration of the poison and the ability of the different organs to deal with the toxin. I think that there is a specific eclampsia poison, or group of poisons, probably of protein composition. It is probably a colloid, hence is not readily removed from the circulation by purgation. This may even be produced in a normal pregnancy, but be eliminated, with a minimum of damage, owing to the integrity of the organs dealing with it, and their continual efficient functioning. This real, though unidentified poison does not always give rise to eclampsia, as you know, for

we have the pre-eclamptic condition, which, if properly treated, will terminate in avoiding eclampsia. To my mind, the question of whether a woman having this poison circulating in her system will have eclampsia or not is a matter of the concentration of the toxin at any one time, and the flash-point, if I may use the term, of the particular individual affected.

The Pathology of the Disease.—The chief changes produced in the various organs are congestion, hemorrhage, degeneration, and necrosis. The liver, the kidneys, the brain and heart are the organs most vitally affected. I think that there are *two* distinct clinical types of the morbid process to be distinguished, and they depend upon the organ more affected.

The Liver Type of Eclampsia.—The patient is jaundiced, vomits, has a tendency to hemorrhages, changes in the urine are not marked, albumin is small in quantity, the blood pressure is not high, convulsions are not marked, coma is common, there is little if any edema, and the pulse is poor. These cases do badly. The post-mortem findings are pretty constant and the characteristic changes are to be seen in the liver. If death has been delayed a few days, the liver is frequently shrunken, the capsule wrinkled, and, on cross section, the liver looks a mottled red and yellow. It is very much like the liver of acute yellow atrophy and delayed chloroform poisoning, or phosphorus poisoning. I have seen cases where it was difficult to find any healthy liver tissue left, almost the whole of the parenchyma being destroyed. The lesions in the liver vary from granular and fatty degeneration, to actual necrosis. Cragin and Hull say. "This necrosis begins at the centre of the lobule, and extends toward the periphery, leaving only a mass of granular detritus surrounding the central vein, the nuclei and cell contents disappearing with only a reticular network in the place of the liver cells. Thromboses with hemorrhage occur throughout the lobule more often than at the periphery. The organ may be swollen or diminished in size, according to the change in the parenchyma. It usually shows a yellowish color and may have hemorrhages under the capsule." (Confirmed by Delafield and Pruden.)

The Kidney Type of Eclampsia.—This is characterized by (1) a high tension pulse, (2) severe headache and epigastric pain, (3) nervous symptoms are marked, (4) edema is generally present, (5) The urine is scanty, of high specific gravity, and contains a large quantity of albumin, blood casts, granular and

hyaline casts, and frequently free blood. On boiling, this urine frequently goes solid. The total nitrogen excreted is markedly diminished. These cases usually have severe convulsions. The post-mortem findings are naturally most marked in the kidneys. The kidneys are swollen, the cortex thickened, pale and congested, the markings less distinct, and the capsule not adherent. Microscopically, the cells of the cortical tubules are swollen, in many places disintegrating. The vessels are injected, and the tubules contain much granular material. (Cragin.) At other times there are areas of actual necrosis. In short, we have an acute toxic nephritis.

Eminent authorities claim that the liver lesions are characteristic of the disease (Williams, Jürgens, Klebs, Pilliet and Schmorl, etc.), on the other hand, equally famous men say the essential lesions are in the kidneys (Winkler, Knapp, etc.), I think that a fuller explanation is that both organs are affected and, when very unevenly so, that organ the more affected dominates the pathological picture, and presents a distinct type.

The brain may have edema, anemia, thrombosis, and necrosis. Degenerative changes also occur in the heart to an extent clinically detectable, and clearly marked post-mortem. The spleen, pancreas, and other organs are affected.

The causes of death are of interest in that they show what to avoid, where this is possible. Asphyxia, exhaustion, heart failure and shock, toxemia, edema of the lungs, septic aspiration pneumonia, anuria, cerebral hemorrhage and thrombosis, and edema of the brain, acute yellow atrophic and necrotic hepatitis, and acute nephritis.

Diagnosis.—Eclampsia has to be distinguished from phosphorus poisoning, which simulates the liver type of eclampsia, and convulsive poisons such as strychnine, from uremia, epilepsy, hysteria, malingering, etc. From a practical standpoint, however, there is rarely serious difficulty. If a pregnant woman comes into the hospital with a history of having had convulsions, and on catheterizing her, a small amount of urine is obtained which has a high specific gravity, albumin and blood, granular and hyaline casts, free blood, and there is edema of the tissues, a high blood pressure, coma, or jaundice, I make a working diagnosis of eclampsia and treat accordingly without delay.

Prognosis.—This should always be guarded. Stroganoff has the best records of a large series of cases, 6.6 per cent. in 400 cases. From that the mortality goes up to 66 per cent. Generally the greater the number of fits the poorer the outlook.

Eclampsia at the sixth month of pregnancy is usually more dangerous than at term.

The onset of jaundice nearly always indicates a fatal termination. A weak, fast pulse and anuria are very grave signs. Sudden and almost unexpected death after apparent improvement must not be forgotten. Only about 1 per cent. of cases recur, and there is usually a chronic nephritis underlying this.

THE TREATMENT OF ECLAMPSIA.

Through the kindness of my chief, Dr. Albert A. Macdonald, the Associate Professor in Gynecology and Obstetrics, I have been given a free hand in the choice of methods used, and the opportunity to present this paper. From personal experience in such great international clinics as the Sloane Hospital for Women, New York, the Rotunda Hospital, Dublin, and others, I have chosen those methods which seemed to me to give the best results. We have now elaborated a plan of action to be used in the treatment of eclamptics at the Western Hospital, subject to such variations as are needed by individual cases. While each step has been used and commended highly by various authorities and heartily condemned by others, the technique we now follow is not generally adopted elsewhere to the exclusion of most other procedures. I contend that the treatment we use is as rational and scientific as our knowledge of the disease will allow.

To be generally and successfully carried out, a technique must be simple and the apparatus uncomplicated and cheap. We are training our house surgeons and students for actual possible practice. Therefore, while immediate vaginal section has given good results in selected cases in skilled hands under ideal conditions, this state of affairs occurs to but few. The intelligent country practitioner can carry out everything essential in our technique.

Just how far we may carry certain procedures, no matter how excellent in themselves, must ever be a matter for most careful judgment.

Prophylaxis.—"Prevention is better than cure." In a large number of cases, eclampsia may be prevented when the danger is known. "Forewarned, forearmed." The public should be educated to take preventive measures against disease. The day will soon be here, I trust, when the life of a woman or child will be considered of greater value than that of a hog. Most of the accidents and preventable diseases associated with

child-bearing can be forestalled by simple investigations honestly carried out during the course of gestation. I should earnestly plead with the profession as a whole for greater care to be taken of pregnant women. A few dollars spent in monthly examinations, especially of the urine, and the blood pressure if need be, would prevent many terrible accidents.

A pregnant woman who has daily efficient bowel movements, who passes over 50 ounces of urine of normal specific gravity, who drinks a sufficient volume of water, who perspires moderately, has a daily bath, is without headaches, dimness of vision, who eats rationally, exercises in reason, has a normal blood pressure, whose urine has no albumin or casts, will certainly not have any eclampsia.

On the other hand, a pregnant woman who is greatly constipated, passes a high-colored urine, with albumin in it, has a high blood pressure, headaches, dimness of vision, epigastric pain, and vomiting, is very likely to have eclampsia. This woman should be put on a purin free diet, well purged, and plenty of fluids got into her and her skin got acting. If in spite of this the condition persists, have a consultation, and induce labor without shock or trauma.

ACTUAL TECHNIQUE OF TREATMENT.

There is a logical reason for the order we follow. We try to control the fits as soon as possible, without adding further damage to the poisoned organs.

(1) Give one-half a grain of morphine sulphate, hypodermically, and repeat, using one-quarter grain as soon as necessary. Do not give chloroform; it increases the damage without doing any good except to ease the feelings of the onlookers. It has been definitely settled that the convulsion *per se* is only a severe effect; the cause is the high blood pressure where it exists, and the toxic condition of the nervous system. The morphia depresses the nervous system and decreases metabolism and relieves the heart. Its one bad effect, that of retarding the breathing, can be overcome by plenty of fresh air or inhalations of oxygen. The latter is good, for there is always a decreased oxydation in eclampsia.

(2) Prevent the patient from injuring herself; have a sheet tied over her, so she cannot spring out of bed. In a fit, place a rolled handkerchief between the teeth to prevent the tongue being bitten. and turn the patient on her side to prevent

the aspiration of vomitus, infected secretions, etc., that might easily give rise to an aspiration pneumonia.

(3) Remembering constantly that eclamptic women are very easily infected, and taking every precaution to avoid sepsis, give 1,000 c.c. of normal saline at 100 Fah. under the breasts, not into them. The sterile normal saline, being a very stable salt solution, is not likely to add to the sodium concentration present in eclampsia. I have the area into which the needle is to be injected painted with tincture of iodine, 2½ per cent. iodine in ethyl alcohol. This hypodermoclysis is of the utmost value in diluting the toxins and preventing thrombosis and inducing diuresis. Jardine, of Glasgow, has had very fine results with it. He adds sodium acetate. Williams and De Lee are very favorable to it.

(4) Withdraw a quantity of blood by aspiration of a vein, under antiseptic and aseptic precautions, or do a venesection. This directly lowers the blood pressure and removes a definite amount of the eclamptic toxin which is causing the convulsions and the high blood pressure. The amount of blood to be withdrawn is a matter of good judgment. A big, plethoric woman who is cyanosed can stand the withdrawal of 20 to 30 ounces easily, with the greatest benefit; the volume of the blood is replaced by the saline. In an anemic, emaciated woman, with low blood pressure, the abstraction of five or ten ounces of blood does good. The underlying principle of removing an inorganic poison from the stomach in poisoning is just the same. There may be considerable difficulty in getting any blood, for the tendency for the blood to clot is very great. Cases where it is at first impossible to get any blood from a vein, after the lapse of a couple of hours, become easier, because the blood is diluted by the saline. In one case I shall quote later, that of post-partum eclampsia, the withdrawal of twenty ounces of blood had a most dramatic effect. I have never seen a case of eclampsia where definite good was not accomplished by the withdrawal of blood. I have never seen a case of eclampsia followed by post-partum hemorrhage. Most of the recent works strongly recommend blood letting (Williams, De Lee).

(5) Empty the uterus. Carefully examine vaginally to ascertain the condition of the cervix. If it is soft and will admit three fingers, get the woman prepared for instrumental delivery. Give a general anesthetic. Nitrous oxide and oxygen are the best, then comes ether. The cervix can now be

carefully dilated with the gloved fingers to full dilatation and forceps carefully applied, using axis traction if possible. If the child is dead, and it very frequently is in hospital practice, do not hesitate to do a craniotomy if the head is large or the outlet small.

In case the cervix is rigid and small, use a good type of hydrostatic bags. In my opinion they are by far the safest and surest means of dilating the cervix without trauma or shock, and they imitate Nature's bag of waters. The cervix can be opened by a Goodell dilator enough to admit one finger, and then put in number one Voorhees' bag and dilate. As soon as this comes through, replace by number two. I sometimes use traction of two or three pounds to hasten the dilatation. Frequently, when number two has come through, the cervix can be further dilated manually. Don't be in too great a hurry. Avoid trauma and shock. If more than a couple of hours have elapsed since the first convulsion, the matter of taking a few hours extra to gradually dilate and carefully deliver will not only do no harm, but be productive of good. (Confirmed by Bumm's statistics.)

(6) Eliminations. (A) By the Intestinal Tract.—Give several enemas. When the bowel is unloaded, give a large enema of magnesium sulphate, two ounces dissolved in a small quantity of water. An enema I have given frequently is called a one-two-three—one part glycerine, two parts magnesium sulphate, and three parts water. This is usually effectual. Having cleared the bowel, start giving tap water, about 110 Fah. Saline is not necessary. If possible wash out the stomach and put down two ounces of magnesium sulphate. This is by far the best purgative, as it gets rid of a large volume of fluid, and any of the magnesium absorbed helps to calm the nervous system without the dangers attending the intravenous injection of magnesium sulphate, which has met with some success in controlling the convulsions in eclampsia as in tetanus. There is some danger, however, of respiratory failure in this latter procedure. Croton oil should not be given to a weakened patient, as it is very depressing and may turn the tide against her.

(B) By the Kidneys and Skin.—Hot packs and stupes are of the greatest service in overcoming the spasm of the superficial bloodvessels and thus lowering blood pressure. They calm the nervous system and help in an indirect way to induce diuresis by relieving the spasm of the renal vessels. Do not be misled as to the value of hot packs. Directly

they do not remove any more of the eclampsia poison than they would strychnine taken by mouth. Hot packs and baths can easily be overdone and the patient exhausted. A profuse sweating after a hot pack is a favorable sign that the body is reacting. It usually means that the kidneys are being relieved at the same time.

Complete anuria is, of course, a very grave sign. If the condition persists more than twenty-four hours in spite of all these measures, the patient is very likely to die. I think that when all these measures have been carefully tried for the twenty-four hours without success, the only hope is in decapsulization of one or both kidneys, as practised by Edebohls. An acute toxic nephritis is present, and the kidney capsule being relatively inelastic, and the kidney being engorged with blood to the extent of shutting off the circulation even, then only operative measures are likely to give any relief.

Short of this desperate condition, I think hot stupes to the loins and cupping are of as much service as in acute nephritis.

I do not give *veratrum viride*, as it only adds another poison and is dangerous if potent. Except in large hospitals, however, it is likely to be inert. It does only harm in those cases of low blood pressure. All the good claimed for it can be obtained in other ways, as I have shown. It is now being condemned. (De Lee.)

Do not give pilocarpine. It is very likely to lead to an acute edema of the lungs, and the sweat it gives is frequently the death sweat.

Accouchement force is a device worthy of the highest praise of Prussian Kultur. The tearing apart of a rigid cervix by the rapid stretching of a Bossi dilator, with the certain prospect of grave injury to the woman and severe shock, if not of speedy death, is most reprehensible.

If there is evidence of dystochia due to the bony parts of the mother being too small or the child too large, if still living, an abdominal Cesarean section is indicated. By using proper protection (such as Halbertsma did not), nerve blocking, etc., after the manner of Crile's anoci-association) the patient can go through the laparotomy with very little shock. Always remember that delivery is not a certain guarantee that the convulsions will stop. Dührssen and Braun claim most convulsions cease after delivery, if this is effected immediately after the first convulsion. Nearly twenty per cent of eclampsia occurs

post-partum. (Williams). Where the convulsions continue after delivery, do not hesitate to bleed the patient.

Where the patient has been catheterized or had internal examinations, I give ten grains of hexamethylene tetramine three times a day, dissolved in plenty of water.

(7) *Ice Cap to Head*.—High temperatures are very grave in eclampsia. I have had an ice cap applied to the head in several cases with apparently good results. It calms the nervous system appreciably.

In cases of great depression, where the circulatory system needs stimulation, I think that the aromatic spirits of ammonia and atropin are good.

I have not tried hirudin (leech extract) as recommended by Dienst, but it does not sound good, for it does not remove the cause.

To recapitulate, use morphia, subcutaneous injection of saline, withdrawal of blood, the use of hot packs, the induction of labor and delivery without shock, the emptying of the gastrointestinal tract followed by purgation, ice cap to the head, and quiet, are means at our disposal which give the best results in eclampsia.

Case Histories.—I shall only give you partial accounts of three cases. They will serve to show, not a perfect technique, but a gradual improvement with very certain and gratifying results.

(1) Mrs. Annie G., age 19, Scotch, primipara, six months pregnant. Had had several convulsions outside before admittance to Toronto Western Hospital. Patient is a strong young woman of about 125 pounds weight. When first seen, at 4 p.m., she was in coma which alternated with the most violent convulsions, needing three persons to control her. She was given a small amount of chloroform until she could be got under the control of morphia. Her blood pressure was S 140 and D 90. A catheter specimen of urine showed a high specific gravity, loads of albumin, granular and blood casts. Her people said that she had had severe headaches and vomiting. As soon as I could get her sufficiently quiet, I tried to get some blood from the veins of the right arm. The blood was so thick that it would not pull through a large needle. I then cut the median basilic vein across, but there was only a little oozing, and clotting occurred at once. I then tried the other side without success. Then I tried to get some blood out of the jugular vein, but again the blood was so thick that I was unable to withdraw

it through a large needle, so I desisted from further attempts to get any blood, and gave 1,000 c.c. of sterile normal saline under the breasts. The convulsions ceased, and I gave one-quarter of a grain of morphine sulphate. One minim of croton oil had been given by the house surgeon before my arrival. A hot pack was given for thirty minutes, and enemas were more or less successful. At 8 p.m. Dr. McPherson, the house surgeon, was able to get four ounces of blood from the left arm. The blood clotted at once, and the superficial veins of the arm thrombosed. This precluded further attempts and the wounds were dressed properly after each incision. Repeated examinations failed to show any fetal life. At 8.30 Dr. Macdonald and myself saw the girl again. The cervix was still hard, but would admit the tip of one finger in the external os. A hot one-per-cent. lysol douche was given, and at 11 p.m. Dr. McPherson put in two glycerine ichthyol tampons. At midnight another 1,000 c.c. of saline were injected. The bowels now began to move freely, and at 3.15 a.m. the head presented, and Dr. Hollis, our senior house surgeon, expressed the fetus, and shortly after the placenta and membranes. Very little blood came away and the uterus firmly contracted. The patient was very much better and slept during the early morning. Rectal enemas were now given of water, and the patient was given one ounce of magnesium sulphate. The urine increased to twenty ounces in the twenty-four hours. On December 9th, 1914, the urine was cloudy still, acid, 1021 sp. gr., loads of albumin, no sugar, granular and hyaline casts, red blood cells, leucocytes and epithelium. December 13th, urine clear amber, albumin present, but less red blood cells. December 19th, urine clear amber, 1023, no albumin, no sugar, a few red cells and epithelium. The patient sat up on the seventh day and made a very good recovery.

(2) Miss Hilda S., age 21, Finlander, primipara, admitted March 26th, 1915, at 7.30 p.m., in labor. Normal delivery of a seven-pound female child; very little blood was lost; a slight laceration of the mucous membrane occurred. I saw her for the first time just after the birth of the placenta. She had been given chloroform as the head was coming over the perineum. I felt her pulse and there was no abnormal tension. So far as I know no analysis of the urine had been made, though I had assumed that it had and everything was normal. At 1.30 a.m. the patient complained of a severe headache, and was given aspirin. Of course, the urine should have been examined by the

house surgeon, but was overlooked. At 1.40 a.m. she had a convulsion lasting three minutes. She frothed at the mouth and was very cyanosed. She was given one-eighth of morphia. At 2.15 a.m. she had another fit similar to the first and was given another one-eighth of morphia. We had a new house surgeon and he was not so familiar with my practice in these cases. At 3.45 a.m. she had another convulsion, was very much cyanosed, and a very weak pulse. A catheter specimen of urine was now taken and sent to the laboratory. It was loaded with albumin and had many casts, kind not noted. The patient was given an enema with good results. Three convulsions occurred between 7 a.m. and noon. Two ounces of magnesium sulphate were given after the stomach was washed out. I was only notified now; I had been given to understand by telephone that the patient had developed puerperal insanity when she realized that she actually had a child. I was thus misled as to the actual condition. When seen at 1.30 p.m., the patient was in a hot pack, so I left orders for an interstitial injection of sterile normal saline and the withdrawal of blood. I ordered 1-200 of a grain of hyoscine hydrobromide in addition to another one-quarter grain of morphia. When I left the patient she was talking somewhat sensibly to me through an interpreter, but complained of a severe headache. Shortly after I had left, before the hot pack was finished, she had a very severe convulsion which lasted five minutes. Artificial respiration had to be resorted to. Then my orders began to be carried out. A one-two-three enema was given, followed by a hot s.s. enema. She had very marked varicose veins of the vulva, and while getting ready to catheterize her, the house-surgeon noted that one was just about to burst, and, getting a dish, he just had to touch the vein and the blood gushed out. Twenty ounces were collected in this unique way, and then the bleeding was stopped and a dressing applied. Shortly after this she began to twitch a little, and, fearing another convulsion, the house-surgeon gave a little chloroform. She was seen at about 4 p.m. by Dr. MacDonald, who ordered twenty grains of potassium bromide to be given by bowel. She did not retain it, however. She passed a fair night and was given 1½ ounces of magnesium sulphate in the morning. There was still albumin in the urine, but the total quantity of urine passed in twenty-four hours was increased, and gradually the urine cleared up. From the time of the first convulsion until the disease was well under control was about twenty hours. The remainder of the convalescence

was without anything of sufficient interest to record. The urine was cleared up on discharge. The temperature went to 100.8 after the second convulsion, and gradually fell.

The last case I shall give a synopsis of is one of the worst I have ever seen, and I consider we were very lucky to have saved the woman.

Mrs. Rosie L., age 20, Russian Jewess, primipara, a patient of Dr. L. J. Solway, who was called in an emergency and sent her, very wisely, to the hospital at once. She was admitted March 20th, 1915, at 8.30 a.m. She had had three convulsions at home, and was in a condition of coma when brought in by Dr. Solway. At 8.45 she had another convulsion lasting three minutes. She was given one-quarter grain of morphine sulphate by Dr. Baker, the house-surgeon, and two minims of croton oil by mouth. She, however, vomited it, and continued to vomit a quantity of dark green fluid. I was summoned to the hospital, and examined her. I had her given a stomach lavage and a couple of ounces of magnesium sulphate given by the tube. I then had 1,000 c.c. of sterile normal saline given under the breasts. I asked Dr. Macdonald to look at her with me, and we decided on emptying the uterus as soon as we could get the cervix fully dilated. It was then very rigid. There was a nearly full-term fetus to be palpated with difficulty owing to the uterus being very tightly contracted on it. An anterior vertex presentation was made out, but the fetus was considered dead as no movements nor fetal heart sounds could be discovered. She was given an enema and got ready for the operating room. Under light ether anesthesia, I catheterized her and gave a hot one-per-cent. lysol douche, and then with care dilated the cervix with a Goodall dilator until it would admit one finger. I then introduced a No. 1 Voorhees' hydrostatic bag and filled it and clamped it and put a string on the end of it for traction, and sent the woman back to the ward. The pulse on beginning the anesthetic was 100 and poor, and the patient was comatose. The urine went almost solid on boiling with the large amount of albumin. There were blood and granular casts.

At 2.30 p.m. she had another convulsion; no urine or bowel movements had occurred up to 5 p.m., when I again visited her. The bag had not yet come through. She had another severe convulsion lasting about four minutes, and went into a state of coma afterward. I had her taken to the operating room again about 6 p.m. On very slight traction on the bag it pulled through. After a preliminary lysol douche, I examined her

again, and the cervix was still rigid, though very thin. I put in the No. 2 bag under light ether anesthesia. I then pulled on it slightly, and the cervix suddenly relaxed and the bag pulled through after about five minutes. I again examined and found the cervix dilatable, and the head engaged at the superior strait in an L. O. A. position. I dilated the cervix manually to full dilation, and then applied the Copeland axis traction solid-bladed forceps, and attempted to deliver. Unfortunately, however, though the forceps held splendidly with no sign of slipping, the head I found to be hydrocephalic, and after some little delay I had to perforate, and then delivered with the forceps. The solid blades protected the maternal parts against the jagged edges of the perforated skull. She was given 1,000 c.c. sterile normal saline under the breasts, and several ounces of blood were lost after the delivery. The placenta and membranes were removed manually and a hot inter-uterine lysol douche was given. She was returned to the ward at 7.30, pulse weak and respirations rapid and shallow. She was ordered to have camphor in oil, grains 3 q. 4 h. At 10 p.m. I again visited her. She was still vomiting and out of the anesthetic. I had her given a one-two-three enema. I ordered her to have 1-150 of a grain of atropine sulphate hypodermically. I visited her in three-quarters of an hour and found that the enema had been fairly successful. I ordered her to have six ounces of saline by the bowel every four hours. She was allowed to have malted milk, water, and weak coffee by mouth. By morning she was considerably better, still no urine was voided as yet.

She was given ten grains of urotropine in hot lemonade every four hours. The lochia was moderate in quantity. I saw her in the morning again and she was considerably better. At 11.10 a.m. she had another convulsion lasting several minutes. (She had voided ten ounces of urine at 10 a.m.) She went into a state of coma after the convulsion for about ten minutes. At 11.50 she was resting quietly and was conscious. The blood pressure in her case was never high. 120 mm. of Hg. Tyco. before and during one convulsion. The bowels moved freely. At 2.10 p.m. she had another convulsion. There was a very offensive odor from the mouth. I saw her again at 3 p.m. and ordered two ounces magnesium sulphate by mouth and another one-two-three enema. This was followed by a free evacuation. At 6 p.m. she had another convulsion. Tap water was now ordered to be given by bowel. For the next two days there was nothing of importance; the urine was increasing to about twenty-five ounces per day. She had some cough; slept fairly

well. Orders were left for the withdrawal of blood and for a subcutaneous saline if there were any more convulsions.

March 24th.—Patient has a severe headache. Seems dazed. Bowels are moving freely. Slight twitching of the muscles of the extremities. Slept most of the day. Restless and twitching and headache. At 6.15 p.m. given one-quarter grain morphine sulphate hypo. Bowels moved freely. At 7 p.m. she had another convulsion. Dr. Baker withdrew four ounces of blood and put her in a hot pack. There was no reaction to this. At 10 p.m. she had another convulsion which lasted a long time. She was put in a hot pack for half an hour and sweated well. She was very violent. Tap water was given by the bowel continuously. At 1 a.m. she had a convulsion, was very cyanosed and very weak; thready, low-tension pulse. Dr. Beatty, our pathologist, who was available, withdrew fourteen ounces of blood, and Dr. Baker gave about 1,500 c.c. of sterile normal saline under the breasts and into the axillae, and gave one-quarter of a grain of morphia hypo. Urine was voided involuntarily. The pulse improved and she had no more convulsions. Although she had severe headaches for several days after this she gradually improved and the urine increased in volume and the albumin gradually disappeared. I have examined the urine repeatedly, and there is not the slightest trace of it. She was naturally weak for some time, and a few days ago her blood showed 75 per cent. hemoglobin. She has lately come to me privately and the uterus is subinvolted, but gradually going down under hot douches and glycerine ichthyol tampons. I am giving her hypodermic injections of iron and arsenic, Zambaletti, with some improvement.

Thus it will be seen that in actual hospital practice, where there are rapid changes of the resident staff, it is hard to have a technique carried out at first until a series of precedents are handed down. But imperfectly as these methods have been carried out, they have given results that are not surpassed by any other, and are superior to most.

73 Bloor Street East.

Addenda: Since writing this paper, I have had some four ward cases of pre-eclamptic toxæmia, two post-partum, which yielded to the above measures without convulsions. I saw three cases in consultation—one woman, delivered of dead child, was very edematous, gasping for air, venesection recommended, 25 oz. of blood withdrawn, immediate improvement, also inhalations of oxygen and hypodermoclysis, cure; 2nd case not so severe, cure; 3rd case had not obeyed her doctor's orders, had not seen him for months, had three convulsions, long attempts at forceps extraction, then breech delivery. Patient moribund when I first saw her, failed to respond to any stimulation; my prognosis of speedy death confirmed in half an hour.

A TREATMENT FOR PRURITUS ANI*(Maryland Medical Journal.)*

BY HARVEY B. STONE, M.D.

As is of course well recognized, pruritus ani is properly a symptom and not a disease. Without discussing exhaustively its etiology, pathology, etc., the cause of the distressing itching may be found in some local lesion, such as hemorrhoids, pin worms, eczema, and various other conditions, or in some constitutional disturbance, of which diabetes may be mentioned as an example. Obviously, where the cause is known, the principles of treatment will be determined by the particular nature of this cause, and it is not the purpose of this paper to discuss such cases. There remains, however, the large and most difficult group of cases in which no causative factor can be definitely discovered and which are grouped under the term idiopathic pruritus.

Various theories—acid secretions, latent infection with special types or organisms, central and peripheral nerve disturbances—have been advanced to account for the condition. No less various treatments have been employed for its alleviation. The whole gamut of ointments, powders, lotions, irrigations, etc., have been employed with varying but never general success. Cauterization, X-ray exposures and vaccines are rather more recent attempts to solve the problem. Operative measures, such as the Ball and Lynch procedures, for division of the peripheral cutaneous nerves, have been employed. The fact that the latter have a certain field of usefulness and popularity is evidence of the extent to which the patient is willing to go to seek relief. One who has listened to the histories of such cases, with long months and years of intolerable annoyance and distress, broken rest, lost sleep and impaired health, will feel that the attempt to improve our methods of attack upon this condition is not an unworthy field of endeavor. It is the purpose of this paper to make a preliminary report of such an attempt.

The success of alcohol injections for producing local lasting anesthesia in facial and other forms of neuralgia suggested the application of the same principle for the abolition of unpleasant sensations from the anal and perianal regions. The alcohol, of course, produces its effect by destruction of the nerve fibres with

which it comes in contact. Hence, in essential principle, such a treatment is quite analogous to the Ball and Lynch operations referred to above, in which the cutaneous nerves are destroyed by direct mechanical division, instead of by chemical attack. The alcohol method presents certain definite advantages that will be referred to later. There are certain possible disadvantages also that will be considered at once. Since there is no selective action of alcohol, by which motor nerves are spared, and only sensory ones injured, one might expect a loss of sphincter control if the injections were allowed to come in close relation with the motor branches to the muscles. Also, an injection of a substance causing tissue destruction, if too superficially placed, might be expected to cause a slough and resultant ulceration.

In order to test these possibilities by actual experiment, alcohol injections about the anal regions in dogs were performed, the depth of introduction being varied. Without detailing the protocols of experiments, the following facts were clearly proved: Alcohol injections will produce complete local anesthesia. If introduced deeply enough to come in contact with the motor nerves, sphincteric paralysis and resultant incontinence are produced. If introduced quite superficially—that is, within the skin itself—superficial sloughs are caused. It is quite possible, however, and not very difficult, to produce anesthesia with no sphincter paralysis or skin ulceration; and this by introducing the needle entirely through the skin, but injecting the alcohol immediately under the skin and never deeper than that.

The method has been tried so far in only four clinical cases and for a period so far covering only a few months at most. This, therefore, can only be considered a preliminary report. The facts observed are as follows: Entire and immediate abolition of the itching from the area injected, along with other sensation, leaving an anesthetic zone. No sphincter disturbance. A slight superficial slough in one case where the injection was made into the skin proper instead of under it, due to the patient pulling away just at the moment of injection. The anesthesia may last at least three months; how much longer I am not prepared to say.

As to technique, it is simplicity itself. An ordinary hypodermic needle and syringe, boiled, is filled with 70 per cent alcohol. The skin is prepared as for ordinary hypodermic injection. The needle is introduced well through the skin in the area to be treated, and then made to travel along directly under the skin, depositing the alcohol, until the whole area has been thus infiltrated. The

needle is never plunged in deeply, nor is it allowed to engage in the corium while injection is taking place. The thing is much easier to do than it sounds. The injection causes acute intense pain for a short time, one to two minutes only. Then sensation is lost. This may be prevented by a light general anesthetic, if desired, or by preceding the alcohol injection by that of some local anesthetic. There is no subsequent treatment required.

This method accomplishes practically the same thing as the operative treatment for pruritus, and is fairly indicated in those cases of great intensity where usual measures have failed. It has certain distinct advantages over the operative procedures. It is safer; there is no undermined skin with impaired circulation, with a potential dead space under it, in an area impossible to keep clean. It is quicker. It entails no dressings, stitches or other post-operative annoyance to physician or patient, and no hospital expense. It is quite as likely to be enduringly satisfactory, and presents no greater possibilities of trouble.

The cases herein reported without detail have been done in the Johns Hopkins Dispensary since January, 1915. It is the intention to carry the work further as opportunity offers and publish a more extensive report at some later date.

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COMMENT FROM MONTH TO MONTH

Twilight Sleep was introduced into America about a year ago, though all will remember the old scopolamine-hyoscine-morphine treatment of a decade ago. If it be a safe measure for good the profession will welcome with all due enthusiasm its advent as something which will render the travail of childbirth painless. It has been employed in Toronto, both in hospital and private practice, as well as in other Canadian cities; so our Canadian profession has not been backward in this respect compared with other cities on this continent.

But what strange times have we fallen upon! Not long since the public press—and this “new” treatment first gained notoriety on this continent through the medium of a lay magazine—attempted to bludgeon the medical profession to employ Friedman’s so-called “cure” for tuberculosis, and with the most unhappy results. Again the public press is cutting in before the medical profession have seemed to satisfy themselves that the treatment is one void of all danger to both mother and child; for, if the medical press is to be believed, the opinions of eminent members of our profession on the subject are very conflicting. Therefore, each general practitioner must experiment and observe for himself.

Still, there is this fact which stands out prominently—obstetricians with large clinical experience are apparently satisfied with its favorable aspects.

Prospective mothers and others appear to have entirely overlooked the fact, however, that this treatment is attended by greater danger to the child than in natural labor; for, it would appear in the vast majority of cases, the child is born in a state of suspended animation. Indeed, from cases reported, it is not to be considered that the mother is altogether free from danger.

There is also a delusion connected with this treatment. It is asserted that the woman in labor is not free from pain, that it is not unusual to have her crying out for "twilight sleep" after she has already received the injection. Some have been even known to cry out for chloroform. In other words, she has the pain all the time, but fails to remember that she had it when in labor, on the passing of the effects of the injection.

Two points stand out pre-eminently: That the doctor and nurse should be in constant attendance; that it is best administered in hospital. It is doubtful if it can ever be administered in every home.

Saskatchewan has adopted a good law with regard to child-births. Every time a mother gives birth to a child the province pays her \$25. The medical attendant also receives for each case from the Government a fee of \$15. Thus, by wise provision, does the Government of Saskatchewan seek to counteract the evils of "race suicide," rewards the mother for her part in populating the State, and recompenses the physician, who is recognized as an important factor in the betterment of the race. As time goes on the physician becomes closer attached to the State, not alone in public health, but now at the beginning of life of the State's greatest asset, the life of every child.

Public Health and Preventive Medicine presents a great field for statesmen. For long years the health of the people was subordinated to the health of the cattle on the hills and prairies. The great war is more than decimating the nations. The problem will be not so much race betterment as one to fill up the ranks. The two, however, must ever go hand in hand.

In the province of Ontario recently, two important commissions have been appointed. There are others. It is doubtful if

all of them combined commence to measure up to the importance of public health and preventive medicine. Those commissions already appointed are composed of men who give all their time to the work in hand, on large salaries.

The Board of Health of Ontario, for many years, has given its services gratuitously. Preventive medicine, of course, has never been very active in party politics; but when it is realized by the people what a vast amount of good a Commission of Public Health, composed of whole-time officers, could do for the people, then the people will demand to be better protected from the ravages of disease.

Speaking of Public Health, is there any responsibility resting on the medical profession, or its representative bodies, such as the Medical Council, the Academy of Medicine, or the provincial medical associations in regard to the right teaching of the public with regard to all matters pertaining to preventive medicine? And as to newspaper treatment?

Many of the large dailies now run, especially in their Saturday editions, columns which, if they are to be run at all, should surely be contributed by some responsible person delegated by some representative medical society or body. It is surely not in the best interests of the people, the medical profession, or the newspapers to have syndicated articles from irresponsible persons.

If public health matters are to be dealt with in the lay press by people who are not physicians at all, but mere quacks in some American city, simply exploiting the public for their own selfish ends, then the people should be apprised of the standing of the men who furnish this "copy" in their own respective communities. A great newspaper which takes subscription fees from the medical profession, and furnishes "information" on public health matters from quacks, brings itself into contempt with educated people, and deserves only to be laughed at by people of common sense.

The matter of furnishing "copy" to newspapers is important enough to engage the attention of the Medical Council, as the representative body of the profession.

Editorial Notes

MEDICAL COMMISSION

Redeeming a promise made by the late Sir James Whitney to osteopaths and chiropractors, who have asked for special recognition, the Ontario Government has appointed Mr. Justice Hodgins, of the Supreme Court of Ontario, a commissioner to inquire into the whole subject of medical education. The action of the Government comes after a long delay.

During the past five years the Private Bills Committee of the Legislature, and even the Government itself, have frequently been asked by the Osteopathic Association and also the chiropractors that they be allowed to practise as regular doctors, barring the use of medicine, and also be allowed to establish colleges. The osteopaths specially desired protection for qualified practitioners from unqualified osteopaths.

The investigations of Judge Hodgins will take some time, as there are many branches that will have to be probed. He may have a report ready for the next session of the Legislature. The duties of Judge Hodgins are outlined as follows:

WIDE POWERS GIVEN.

To inquire into and report upon all or any matters relating to education for the practice of medicine in or affecting the Province of Ontario; the constitution, powers, duties and regulations of any body corporate or unincorporated and of any faculty or department thereof having any relation to medicine, the exercise of the same and the revenue and expenditures thereof; the situation, legal or otherwise, of such bodies in regard to each other or to the province; the establishment, creation, control and regulation of any new body intended to have relation to medicine; the existing or possible methods of examining, licensing or otherwise authorizing the carrying on by individuals of the practice of any methods having any relation to medicine and the standards prescribed and followed or proper to be established and followed; the present positions, status and practice of osteopaths, dentists, nurses, opticians, optometrists, chiropractors, Christian Scientists or others practising or professing medicine; the existing laws of Ontario in relation to any of the foregoing and their practical operation; any matter arising out of the foregoing which it is necessary to investigate with a view to the above inquiries.

DOCTORS MET IN EXETER

One of the most successful meetings of Huron Medical Association was held in Exeter on Wednesday last, Sept. 8th. Some twenty or more physicians of Huron sat down to a splendid dinner at the Central Hotel. The Seaforth doctors and an auto load, including Doctors Septimus Thompson, McGregor, Arnott, Shoebotham and Beale, from London, were too late for dinner.

The meeting was called to order in the Public Library by the President, Dr. Kennedy, of Wingham.

The Secretary, Dr. Redmond, read the minutes of the previous meeting, which were approved. He then read a notice from the Provincial Society asking that some action be taken with regard to having all the different local associations affiliate with the Provincial Society. Drs. Emmerson, of Goderich, and McKay, of Seaforth, moved that the matter be laid over till the next meeting for further consideration. Another communication from Dr. Anderson, of Toronto, asking that the Society join with all the other associations of the Province in memorializing the government as to the need of forming a base hospital for wounded Canadian soldiers. Moved by Drs. Shaw of Clinton and Hunter, of Goderich, that the Secretary do this.

Dr. Williams, of London, was then called upon and gave an able and instructive paper.

This was discussed by Drs. Gunn, Taylor, Quackenbush and Emmerson. A motion was then moved that Dr. Williams be made an honorary member, was carried.

Dr. Emmerson, of Goderich, next read a splendid paper on "Functional Diseases of Children." This was discussed by Dr. McGregor, of London.

Dr. Gallow's paper on "Occipito-posterius Positions," came next, and a discussion by Drs. Arnott and Beale, of London, followed.

The meeting then closed, to meet in Clinton in December.

THE SUDDEN TURNING GREY OF THE HAIR

The sudden turning grey of the hair under the influence of great emotion is a phenomenon so remarkable that it has always aroused curiosity. The well-known historical instances, such as the case of Marie Antoinette, who is said to have become grey in the night before her execution, are open to some doubt, but several well-authenticated cases have been published by medical observers.

At a recent meeting of the Societe Medicale des Hospitaux of Paris, M. Lebar reported the following case: A soldier, aged twenty-three years, was in a trench in Argonne which was blown up by a mine. He was projected into the air and fell, and was covered by a mass of earth, from which he succeeded in extricating himself. The detonation was such that he immediately became deaf. This was attributed to double hemorrhagic labyrinthitis by M. Cousteaud, who subsequently examined him. The deflagration of the powder produced superficial burns of the face, and there were several bruises on the head, which were greatest on the left side. He was taken to the English hospital at Arc-en-Barrois, where on the following day he noticed, to his surprise, tufts of white hair on the left side of the head. These formed four "islets" in the left fronto-parieto-occipital region separated from one another by normal hairs. The loss of color was complete from the roots to the ends of the hairs and the longest hairs were just as white as the shortest. There was not a brown hair amidst them. The grey hairs were solidly implanted and could be pulled out only by strong traction. The bulbar swelling of the hair was equally decolorised. After the accident the patient suffered from incessant twitching of the left eyelids. The rest of the hair of the head was dark brown and there was not a white hair in the beard or moustache. The patient was an intelligent man, and the truth of his story was confirmed by the fact that his hair was described in his "livret militaire" as "marron foncé." The mechanism of sudden loss of color of the hair is not well understood. It might be suggested that in this case it was due to bleaching by gases generated by the explosion, but this was negatived by the fact that the intracutaneous parts of the hair were decolorised like the rest. The studies of Metchnikoff on the whitening of the hair due to age throw light on the question. According to him, when a hair begins to whiten there appear in the cortex round or oval cells with prolongations which gradually come into relation with the cells containing the pigment granules and absorb them. These "pigmentophages," as he calls them, then descend toward the root of the hair to scatter in the dermis, of which they are, according to him, the pigmentary cells. The pigmentophages, which originate in the medulla of the hair, disappear completely when the decoloration of the hair is achieved. This theory explains a slow and progressive decoloration of the hair of senility, and also applies to the rapid loss of color now under consideration. This rapid mobilization of the medullary cells appears to be provoked by a nervous disturbance. The place of whitening seems to be determined by the points on the scalp which have been the seat of injury.

In the case reported above it was the left side of the head and face which was most injured by the explosion and the fall of earth, the labyrinthine lesions were more marked on this side, and the twitching of the eyelids was confined to this side. It was solely on the left side that the hairs were whitened. This influence of local causes is illustrated by cases which have been recorded of partial canities on parts submitted to pressure.

SUBSTITUTES FOR GERMAN DRUGS

The war has brought forcibly to our notice the extent to which the Germans had been allowed to control the British drug trade. Many drugs hitherto regarded as British products have been found unavailable or procurable only at greatly enhanced prices owing to the fact that they were "made in Germany," whilst others are difficult to get because they were products made by one or other of our Allies whose factories have been put out of action by the war. Practitioners will be glad of information which will enable them to distinguish "alien" from "allied" productions and help them in the selection of suitable substitutes which will enable them to prescribe with due regard to patriotism and economy as well as the welfare of the patients.

The Prescriber (January and March, 1915), publishes the following list of the more important of these products with their chemical equivalents. The list is by no means complete, but in case of doubt the best procedure is to prescribe the drug under its original name and to add the words "British substitute," leaving the selection to the pharmacist.

- Airol: Bismuthi Oxyiodogallas.
- Alypin: Amydricainæ Hydrochloridum.
- Antipyrin: Phenazonum.
- Anusol: Sanusin.
- Aristol: Thymolis Iodidum.
- Aspirin: Acidum Acetyl-salicylicum, B.P.
- Benzozol: Guaiacol Benzoas.
- Bromipin: Brominol.
- Chloralamid: Chloral formamidum, B.P.
- Creosotal: Creosoti Carbonas.
- Cystopurin: Urosolvène.
- Dermatol: Bismuthi Subgallas.
- Dionin: Ethylmorphinæ Hydrochloridum.
- Diuretin: Theobrominæ et Sodii Salicylas, B.P.

- Duotal: Guaiacol Carbonas, B.P.
 Eau de Cologne: Spiritus Coloniensis, B.P.C. (many excellent British brands are obtainable).
 Eucaïne (beta) Lactate: Benzaminæ Lactas, B.P.
 Euquinine: Quininæ Ethylcarbónas.
 Europhen: Butyl-crésyl iodidum.
 Exalgin: Methylacetanilidum.
 Fibrolysin: Thiosinamin Sodio-Salicylas.
 Formamint: Tabletæ Formaldehydi, B.P.C.; Formalin Tablets (Formitrol, etc.)
 Helmitol: Formamol.
 Heroin: Diamorphinæ Hydrochloridum, B.P.
 Hetol: Sodii Cinnamas.
 Ichthyol: Ichthamol; Ammonii Ichthosulphonas.
 Iodipin: Iodatol; Iodinol.
 Lysol: Liquor Cresol Saponatus, B.P., resembles Lysol in properties, and there are many good brands of "British Lysol" on the market. It is usually sufficient to order as "Lysol (British)."
 Medinal: Sodium Mallourea.
 Mesotan: Salicylic Methoxy-methyl ester. Methyl Salicylas, B.P., may be prescribed in its place.
 Migrainin: Antipyrinæ Caffeinæ Citras.
 Potassium Salts: Many of the potassium salts being at present manufactured in Germany, it is advisable, where possible, to prescribe the equivalent *sodium* salt.
 Protargol: Argenti Proteinás.
 Purgen: Phenolphthaleinum, B.P.
 Pyramidon: Amidopyrin.
 Salvarsan: Arsenobenzol. Salvarsan is now being manufactured by British makers.
 Sanatogen: This is a mixture of casein and sodium glycerophosphate, and there are many good products to replace it. "British substitute" may be ordered.
 Somatose: Albumose.
 Stypticin: Cotarninæ Hydrochloridum.
 Styptol: Cotarninæ Phthalas.
 Tannoform: Methyl di-Tannin.
 Tannigen: Acetannin; Acidum Acetyl-tannicum.
 Trional: Methyl Sulphonal, B.P.
 Urotropine: Hexamina, B.P.
 Veronal: Barbitonum, B.P.
 Xeroform: Bismuth tribromphenol.