

PUERPERAL DIPHThERIA.¹

BY

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At the annual meeting of this Association held at Richmond last year I read a paper entitled "The Treatment of Puerperal Infection," in which I reported two cases of puerperal infection successfully treated by the use of diphtheria antitoxin serum. Since the report of those cases, believing that diphtheritic puerperal infection had not been heretofore sufficiently recognized as such, I have had, and taken advantage of, the opportunity of extending the line of investigation suggested by them to the extent of proving that, in the city of Detroit at least, the Klebs-Löffler bacillus is a most important factor in the etiology of puerperal infection. The cases which are herewith reported comprise only those in which the diagnosis of diphtheria was proved by cultures made from the matter taken from the genital tract and submitted to the bacteriologist of the Health Board of Detroit. The cultures were all carefully made, the culture tubes prepared by the Health Board for this purpose used, and the infectious material taken, through a speculum, from the mouth of the uterus.

A number of cases came under my observation in which the bacteriological examinations indicated other sources of infection; but as a report of them would only add to the length of the paper, without materially increasing its value or interest, they will not be here recorded. I also treated one other case with Dr. James Cahalan, of Wyandotte, Michigan, in which the infection occurred toward the end of the second week after confinement, when all the indications pointed to diphtheria as its origin, and in which the diphtheria antitoxin serum was successfully used; but as the diagnosis was not proved by bacteriological examination, and its scientific value thus lost, it will not be reported in detail. As all the cases here detailed were observed by me in the capacity of consultor, I have requested reports from each of the physicians who had the

¹ Read before the American Association of Obstetricians and Gynecologists at the annual meeting at Niagara Falls, August 17th to 20th, 1897.

immediate charge of the patients, and will give the reports as received from them.

CASE I.—Reported by Dr. Mary E. Walker, senior house physician of the Woman's Hospital, Detroit. Hattie B., age 16, American, primipara, was confined January 14th at the Woman's Hospital. Labor normal; perineum lacerated. January 20th: Temperature reached 104° at 8 P.M. Left breast was painful and swollen. Temperature ranged between that and 100.5° until January 22d, when patient complained of sore throat. Left tonsil showed patches. A culture was made and sent to the Health Office, which reported Klebs-Löffler bacilli. January 22d: Morning temperature 100.5°, pulse 95; evening temperature 104.2°, pulse 108. January 23d: Patient was sent to Harper Hospital. Patient was discharged from Harper Hospital January 29th. After her return to the Woman's Hospital temperature was 103.4°, pulse 115. Quinia gr. x. and whiskey $\frac{3}{4}$ i. given. Evening temperature 104.6°, pulse 102. January 30th: Morning temperature 104.8°, pulse 112. Vaginal examination showed membranous exudate on vaginal wall and on cervix uteri. At Dr. Longyear's direction a culture was made and sent to the Health Office, which reported Klebs-Löffler bacilli. Quinia sulphate gr. v. given every three hours till gr. xxx. given. Compound cathartic pills No. ii. given. Bichloride douche 1:2000 used. Bowels moved freely. Evening temperature 103.6°, pulse 112. Diphtheria antitoxin serum (1,500 units) injected into gluteal muscles. Midnight temperature 100.6°, pulse 96. January 31st: Morning temperature 99.6°, pulse 84; evening temperature 101.4°, pulse 96. February 1st: Morning temperature 100°, pulse 88; evening temperature 103.2°, pulse 98. February 2d: Morning temperature 100°, pulse 84; evening temperature 103.6°, pulse 100. Bichloride douche 1:2000 given daily. February 3d: Morning temperature 100.8°, pulse 98; breast abscess opened and much pus discharged; evening temperature 99.6°, pulse 84. The vaginal membrane disappeared and the temperature came down gradually. Patient was sent to convalescent ward February 6th in fair condition.

CASE II.—Reported by Dr. L. J. Lennox, Detroit. Mrs. B., age 24 years, confined February 15th, 1897. Normal labor, prolonged second stage; gave chloroform and delivered with forceps; unilateral laceration of cervix, but none of the perineum or vagina. Everything progressed very favorably until the middle of the fourth day, when patient was taken with a

very severe chill which lasted one hour; in fact it was so severe that it resembled a convulsion. Temperature was 101° at noon, and in the evening 103.6° . I then curetted the uterus and washed it out with sterilized water, and also with iodine solution one drachm to the pint. On the fifth day temperature 101° ; slight chill at noon; washed out uterus as before. On the sixth day temperature 100.8° ; at noon a slight chill; evening temperature 102° , pulse 120. On the seventh day temperature 102.8° ; at noon a more severe chill occurred. Called Dr. Longyear in consultation in the evening. The doctor examined and swabbed out the uterus with iodine and carbolic acid, used douche, and put in drainage tube. Sent a culture tube with discharge taken from the cervix to the Board of Health. The same night, believing that the infection was probably of streptococcus origin, I gave antistreptococcic serum, and used two ounces during the following thirty-six hours; no improvement, and on the ninth day the patient died. Did not get report from the Health Board until the morning of the ninth day, after the death of the patient, which report was that the specimen showed pure Klebs-Löffler bacilli.

CASE III.—Reported by Dr. Mary E. Walker, senior house physician of the Woman's Hospital, Detroit. Mrs. Annie O'B., age 24, Irish, primipara, was confined in the emergency ward of the Woman's Hospital March 27th. Labor normal; perineum ruptured and repaired by three silkworm-gut sutures; child in good condition. Before labor temperature and pulse normal; after, temperature was 100.6° , pulse 90. During first six days after labor temperature was higher at night than in the morning, however not going above 100.8° , morning 99° . April 3d: Morning temperature 99.8° , pulse 100; 7 P.M., temperature 102.6° , pulse 84. Quinia sulphate gr. x., spirits frumenti ζ i. 10 P.M., temperature 103.4° ; acetanilid gr. viii., and cathartic mixture ζ i. April 4th: Morning temperature 99.6° , pulse 112. Patient complained of soreness across the abdomen, which was relieved by turpentine stupes. Vaginal examination showed the cervix and vaginal erosions covered with a thick, grayish-white membrane. At Dr. Longyear's direction a culture was taken from the cervix, which was reported by the Health Office to be almost pure Klebs-Löffler. Hydrogen peroxide 3 ij. was injected into the vagina every two hours. Cathartic mixture ζ ij. every two hours until effectual. 11 A.M., temperature 101° ; acetanilid gr. viij. given, and douche 1:5000 bichloride of mercury used. 2 P.M., temperature 103° , pulse

120; 5 P.M., temperature 102.4°, pulse 112; 1,500 units of diphtheria antitoxin serum injected into the gluteal muscles. 8 P.M., temperature and pulse normal; slept well. April 5th: Morning temperature 100.2°, pulse 100. Patient complained of abdominal pain; turpentine stupes applied. Bichloride douche 1:5000 given three times daily. Patient transferred to isolation ward. Evening temperature 102.4°, pulse 96; 1,500 units diphtheria antitoxin serum injected into the gluteal muscles; slept well. April 6th: Morning temperature 101.4°, pulse 120. At Dr. Manton's direction milk with whiskey $\frac{3}{4}$ ss. given every two hours, protonuclein gr. v. three times daily, and quinia gr. viij. at night. This medication was carried on as long as patient remained in isolation ward. 8 P.M., temperature 100.2°, pulse 112. Blue mass gr. viij., calomel gr. ij., sodium bicarbonate gr. ij., extract rhubarb gr. ij. given. Patient slept well most of the night. April 7th: Morning temperature 102.8°, pulse 76; evening temperature 100.6°, pulse 104. April 8th: Morning temperature 100°, pulse 96; evening temperature 99.4°, pulse 100. Temperature fell and on April 10th was normal. April 11th: Culture made from vaginal mucous membrane, which proved to be negative; lochia purulent; patient sitting up. April 12th: Transferred to emergency ward.

It may be interesting to note that April 15th patient's temperature reached 102° in the evening. April 19th: Complained of severe pain in side (pleuritic in character), relieved by painting with iodine. April 22d: The breathing was very quick and labored; evening temperature 104°, pulse 112. There were no symptoms on the part of the reproductive organs. Temperature varied from 2° to 3° between morning and evening. Patient developed cough. Was discharged May 19th. Tubercle bacilli were found in sputum.

CASE IV.—Reported by Dr. Mary E. Walker, senior house physician of the Woman's Hospital, Detroit. Sophie von R., age 19, American, primipara, entered the emergency ward at the Woman's Hospital some weeks before confinement, which occurred March 29th, 1897. Labor normal, no laceration; pulse and temperature normal both before and after delivery. March 30th: Complained of abdominal pain, which was relieved by applications of heat. April 1st: Evening temperature 99.2°, pulse 80. April 2d: Morning temperature 99.2°, pulse 96; evening temperature 100°, pulse 72. April 3d (fourth day): Morning temperature 99.6°, pulse 90. Patient complained of pain in her back during the day. 8 P.M., temperature 104.2 . pulse 108

Carbolized douche used and quinine and whiskey given. Complained of great pain in the back and abdomen. Turpentine stupes applied. 9:30 P.M., vomited. 10 P.M., temperature 104.4°. Acetanilid gr. viij., and cathartic mixture ζ i., given; no effect on bowels. April 4th: 4 A.M., temperature 100.6°, pulse 112. 8 A.M., patient had slight chill; temperature rose to 104°, pulse 120, lochia diminished. 11 A.M., temperature 105°. Quinia sulphate gr. x., whiskey ζ i., cathartic mixture ζ iss. By direction of Dr. Longyear examination was made and the cervix uteri and several tears in the mucous membrane of vagina were found to be covered with a grayish-white membrane. Culture made, which was reported by the Health Office to contain Klebs-Löffler bacilli and streptococci. 11 A.M., 1:5000 mercuric chloride intrauterine douche given. Hydrogen peroxide 3 ij. injected into the vagina every two hours. 2 P.M., temperature 105.4°, pulse 144. Magnesium sulphate ζ ij. given in rectal injection. Acetanilid gr. viij., tincture digitalis \mathbb{M} xx. given. 4 P.M., temperature 103.2°, pulse 112. 5 P.M., antidiphtheritic serum, units 1,500, injected into gluteal muscles. 8 P.M., temperature 100.6°, pulse 112. Midnight temperature 100°, pulse 104. Patient had little sleep. Bowels moved several times during the night; stools yellow, very loose, contained much mucus. April 5th: Morning temperature 103°, pulse 122. Tongue coated, patient feeling very weak. Bimanual examination revealed tenderness and swelling in left ovarian region. Acetanilid gr. viij., and whiskey ζ i. Bichloride douche used. 4 P.M., temperature 105.2°, pulse 120; 1,500 units antidiphtheritic serum injected into gluteal muscles. Evening temperature 104°, pulse 120. Patient transferred to isolation ward. April 6th: Morning temperature 102°, pulse 120. Patient slept well. Bichloride douche 1:5000 three times daily. By Dr. Manton's direction, protonuclein gr. v. three times daily; whiskey ζ i. and milk every two hours. Quinia sulphate gr. viij., and phenacetin gr. v., at night. Evening temperature 103.2°, pulse 112. Blue mass gr. vi., and calomel gr. ij., given; effectual. April 7th: Passed a good night. Morning temperature 100.4°, pulse 96; evening temperature 100.6°, pulse 100. April 8th: Slept well. Morning temperature 98.4°, pulse 96; evening temperature 99.8°, pulse 100. April 9th: Morning temperature 99°, pulse 96; evening temperature 103.4°, pulse 100. Complained of intense pain in the abdomen. Breathing rapid and painful; very restless. April 10th: Morning temperature 102°, pulse 104; evening tempera-

ture 103.2°, pulse 120. Passed a hard night; much pain in the abdomen. Turpentine stupes applied. April 11th: Morning temperature 100°, pulse 120. Culture taken from membrane of cervix and vagina; no growth. Evening temperature 103.2°, pulse 104. April 12th: Morning temperature 103°, pulse 120. Much pain across abdomen; relieved by stupes. Evening temperature 102.8°, pulse 120. April 13th: Morning temperature 101.2°, pulse 110. Temperature rose steadily until 2 P.M., when it reached 105.8°, pulse 124. At 11 P.M. temperature 104.6°, pulse 128. Quinia bisulphate bath given, which reduced temperature to 102°. April 14th: Rested fairly well and took nourishment well during the night. Morning temperature 98.6°, pulse 110; evening temperature 102.4°, pulse 112. Patient passed a good night. April 15th: Morning temperature 100.8°, pulse 108; evening temperature 98.8°, pulse 100. April 16th: Temperature normal. Patient gained strength rapidly. April 17th: Transferred to emergency ward. Discharged May 4th in good condition.

CASE V.—Reported by Dr. B. R. Hoyt, Detroit. Mrs. H. was delivered by a midwife, April 12th, 1897, of her seventh child. I was called on April 20th, and found well-defined septicemia present, with a temperature of 103°. Cured the uterus and washed it out with carbolyzed water. April 21st: Cured it again and washed the uterine cavity with solution of permanganate of potassium. Temperature continued high—103°. On April 23d I called Dr. Longyear, who made a culture and removed a patch of diphtheritic membrane from the cervix, applied iodine and carbolic acid to the uterine cavity, and irrigated with bichloride solution. Evening temperature 104°. April 24th: The bacteriologist of the Health Board reported the culture to contain Klebs-Löffler bacilli. Diphtheria antitoxin serum, 1,500 units, injected into the muscles of the thigh. Repeated injection April 25th. April 26th and 27th, temperature was normal. April 28th, high temperature returned, evidently due to phlebitis of left leg. The inflammation of the genital tract subsided completely and gave no further trouble. The inflammation of the veins developed into an aggravated form of suppurative phlegmasia. May 17th Dr. Longyear was again called. A small abscess under the knee was opened and the pus submitted to the bacteriologist of the Health Board, who reported it to contain streptococci. During the next three days three doses of streptococcic antitoxin serum were injected into the gluteal region, but no change in the febrile conditions

was produced. Marked depression followed each injection to such an extent that the patient refused to follow the treatment. June 5th: Acute phlebitis began in the opposite leg, resulting in the development of a number of small abscesses, which were opened from time to time. The febrile symptoms continued with marked persistency for nearly two weeks more, severe chills and high temperature following each other with more or less regularity. The temperature reached the normal point on June 18th and remained so, and the swollen leg rapidly regained its natural size. The treatment consisted principally in the use of bisulphate of quinia, ten-grain suppositories, and the application of poultices.

CASE VI.—Reported by Dr. L. J. Lennox, Detroit. Mrs. H., age 21, confined April 23d, 1897. Natural labor. Did not use forceps, but cervix and perineum were lacerated. I repaired the perineum at once, and everything progressed favorably until the end of the fourth day, when she was taken with a chill, and on the fifth day temperature was 103°, pulse 120. Cured uterus and washed out with sterilized water and iodine solution one drachm to the pint; cauterized cervix with pure carbolic. On the evening of the fifth day temperature was 104°, pulse 136. On the sixth day temperature ranged from 101° to 104°, pulse 108 to 120. Seventh day, temperature 100° to 104°, pulse 106 to 116. Eighth day, no improvement. On ninth day, or after fever had run four days, I gave diphtheria antitoxin, 1,500 units; temperature 101° to 103°, pulse 112 to 118. On tenth day, or sixth day of fever, gave 1,500 units more of the antitoxin; temperature 101° to 103.6°, pulse 110 to 118. On the eleventh day, or seventh day of fever and second day after antitoxin, temperature 100° to 102.8°, pulse 96 to 108. On the twelfth day, or eighth day of fever and third day after commencing antitoxin, temperature 99.2° to 100.4°, pulse 86 to 96. Fourth day after antitoxin, temperature and pulse still less, and improvement uninterrupted until patient was well. On the first day of fever, by advice of Dr. Longyear (who did not see the patient, as he was just leaving the city when I called in to see him about her), I sent a tube charged with matter taken from the cervix to the Health Board, from which I received a report on the second day, which was that it contained Klebs-Löffler bacilli, but not many and not very active, but no streptococci. Consequently I did not use the antitoxin for two days more. Then, seeing that the patient was getting worse and not better, I gave the diphtheria

antitoxin, and on the second day improvement began and continued.

These cases are presented principally as a contribution to the etiology of puerperal infection, the details of treatment noted in each case being only incidental to the faithful report of them. However, the lesson which they teach leads to the consideration of important therapeutic questions. One of the most important of these is that of the common practice of curetting in all cases of infection. Is it good practice to curette in diphtheria, either of the throat or of the vagina and uterus, or in any infectious disease attended by membranous exudate? If not, then in all cases of puerperal infection is it not wise to defer that operation until the true diagnosis can be determined by bacteriological examination? The indiscriminate use of the curette, when applied to cases of simple infection from any cause, without retention of secundines, is productive of much mischief and should be considered reprehensible practice. The dull curette may, in skilful hands, be used inside the puerperal uterus without doing injury, but I doubt if the sharp curette is a safe instrument for any one to use in such a uterus, with its soft, velvety lining presenting many crypts and folds. Serum therapy, which is accomplishing so much in the reduction of the mortality in the usual forms of diphtheria, is also indicated in this form of the disease and should be administered at the earliest possible moment. Nuclein may also be administered, and local applications and washes, as indicated, used, but the main reliance should be placed on the antidiphtheritic serum. The disease does not usually progress so rapidly as to make dangerous the delay of the twenty-four hours necessary in which to make a diagnosis by culture, but occasionally a case will arise in which this delay may become dangerous, as is well illustrated in the report of Case 2, which, I believe, would have been saved if the antidiphtheritic serum had been used instead of antistreptococcic serum. If diphtheria is prevalent in a community, and a reliable serum can be obtained, I would advise its administration in such a case, even if warranted by only a fair clinical diagnosis, as the pure antidiphtheritic serum is usually entirely harmless and can be used, as in the ordinary form of the disease, in conjunction with other remedies as indicated. Valuable time may thus be saved, and, on the other hand, no harm results if the culture, on the following day, reveals no Klebs-Löffler bacilli present. The cases of mixed infection (usually Klebs-Löffler and streptococcus), I believe,

should be first given the antidiphtheritic serum, as this usually accomplishes its work in from twenty-four to forty-eight hours, and then, if the symptoms persist, the use of the antistreptococcic serum, if indicated, should be begun. Cases 4 and 5 illustrate this point as regards the mixed infection and the continuation of the febrile action after the subsidence of the diphtheritic manifestations. Protonuclein, quinine and whiskey, were used with apparent good effect in combating the streptococcic toxin in Case 4, while in Case 5 the use of the antistreptococcic serum was not begun until after suppuration had occurred, and then only imperfectly used, so that I have not yet had an opportunity to fully test the combined serum treatment. The frequent applications of hydrogen peroxide to the patches of membrane in the vagina I have found to be exceedingly satisfactory. I use the full-strength solution and direct that two drachms be injected into the vagina every two hours. I usually swab out the uterus with a mixture of iodine and carbolic acid at the beginning of treatment. If flexion of the cervix be present, or the free drainage of the uterine cavity is otherwise interfered with, a drainage tube is used. The uterus may be irrigated several times a day with any of the usual antiseptic solutions, but all manipulations should be made as gently as possible so as to avoid abrading surfaces, which will furnish new areas for absorption.

Reports from health departments of many of the large cities of this country, as well as from numerous rural localities, indicate an unusual prevalence of diphtheria during the last year, and it may be argued that such prevalence in the city of Detroit may have resulted in an unusual and unique extension of the disease into the puerperal field. It may be so, but I believe that critical examination of all cases of puerperal infection occurring in localities in which diphtheria exists will reveal many of such cases as those which I have reported. The midwife—who is often the first to examine the sick child among the poor—and the general practitioner should be especially warned regarding the danger from this source of infection.

The conditions of the genital tract following parturition are such as furnish the most favorable soil for the growth of these germs, so that it behooves the accoucheur to exert that *eternal vigilance*—than which none should be greater than in his calling—so that he shall not place the seed of death within this portal of life.

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