GONOCOCCUS ARTHRITIS IN PREGNANCY

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GONOCOCCUS arthritis, it is stated, occurs in from 2 to 5 per cent of all cases of gonococcus infection and is regarded by Osler[1] as the most damaging, disabling and serious of all gonococcus complications. That this complication is less prevalent in the female is well illustrated by a series of 252 cases reported by Northrup,[2] in which 230 cases occurred in the male.

Norris[3] mentions that in a series of 50 cases at Johns Hopkins Hospital, only seven were in the female. It is rather a surprising fact that in the Gynecological Service at the Washington University Dispensary, I can recall no case of gonococcus arthritis in dispensary patients, nor has there been any gynecologic patient admitted to Barnes Hospital since 1914 to the present time, in whom there was present a complicating gonococcus arthritis, or one in whom such a lesion made its appearance during the course of the patient's hospital stay. Considering that there are numerous cases of acute, subacute and chronic gonococcus infections seen annually in these services, gonococcus arthritis is rather conspicuous by its absence.

Norris, in his elaborate monograph on gonorrhea in women, discusses systemic gonorrheal infection at considerable length. He describes gonococcus arthritis as merely a local manifestation of a general infection, the gonococcus being transmitted by the blood stream from the primary focus.

Lindermann,[4] in 1892, was the first to demonstrate gonococci in pure culture from a case of gonococcus arthritis and thus positively established the clinical existence of this condition. Gonococcus arthritis usually becomes manifest during the chronic stages of the original infection, usually from two to eight weeks after the onset of the initial infection, and attacks more than one joint in over two-thirds of the cases.

Thayer and Blumer,[5] in 1896, were first to demonstrate the gonococcus in the blood in a case of endocarditis during life, and at autopsy were able to demonstrate the gonococcus in the vegetations on the mitral valve. That the origin of the infection in their case was the uterus and the vagina was demonstrated by the presence of gonococci in smears from the vagina and uterus taken at autopsy. Norris states that since this report numerous observers have recovered organisms from the blood and gonococcus septicemia has been established as a clinical entity.

Norris[3] tells us that Lofaro, in studying the blood of 67 cases of genital gonorrhea was able to demonstrate the gonococcus in the blood of 39. Lofaro believes that it is only where extremely virulent bacteria are present, or where the soil is especially suitable, that the gonococcus can enter or thrive in the blood. The same investigator points out that a loss of continuity in the surface at the site of the original infection is a predisposing factor to gonococcus septicemia. He also feels that in many instances the gonococci have disappeared from the blood stream when the joint lesions develop.

That gonococcus arthritis occurs only rarely in pregnancy may be assumed because there is no particular detailed reference to such a complication in our modern textbooks. To my knowledge, no great number or series of cases of this character has been reported. This is all the more astonishing when one considers how frequently gonococci are found in the vagina of pregnant clinic patients, and also when we consider that the changes which occur in the vagina and cervix during pregnancy should be the most suitable for the growth of the gonococci and the spread of the infection.

In considering gonorrhea in pregnancy there is little or no mention of widespread infection occurring during this time. In the literature regarding the dangers of gonorrheal infection chief emphasis is laid upon the renewed activity at the time of labor with the resulting puerperal infection and the occurrence of ophthalmia neonatorum; further mention is made of the danger of the infection reaching the decidua during the early months of gestation, resulting in gonococcus deciduitis, which frequently causes the termination of the pregnancy.

Williams[6] states that the occurrence of gonorrhea during pregnancy should never be regarded lightly. He emphasizes the danger of the infection during labor and the puerperium, and informs us that in rare instances widespread infection occurs, as the fatal cases of gonorrheal endocarditis observed in the Johns Hopkins Hospital and reported by Dabney and Harris[7] and J. T. Smith[8] illustrate. The case reported by Dabney and Harris is certainly a good example of a widespread gonorrheal infection during the puerperium. The patient was an unmarried girl, 19 years of age, who died about 24 hours after admission to the hospital, 26 days after a full-term delivery. The case was regarded as an ordinary puerperal infection, although intracellular diplococci were found in the uterine smear. The uterus was apparently well involuted and the adnexa were negative. The highest temperature was 103° F., and on auscultation over the apex of the heart, both sounds were replaced by murmurs. At autopsy the uterus was large, soft and somewhat congested, but there was no evidence of inflammation. Microscopically there was found considerable round-cell infiltration between the muscle bundles. Sections

stained for bacteria were negative. There were present extensive vegetations on the aortic valve and also to some extent, on the tricuspid valve. Cultures from the vegetations yielded the gonococcus, streptococcus pyogenes and the bacillus coli communis. The tricuspid valve yielded no gonococci.

According to Lea,[9] Halle, Jardine and others have reported cases in which the gonococcus was found in pure culture in the puerperal uterus, in the joints and on the valvular vegetations in ulcerative endocarditis. When it is recalled that numerous observers conservatively estimate that the gonococcus is found in 5 to 10 per cent of the vaginae of puerperal women in hospital practice, and also that in the cases of puerperal infection various observers give the gonococcus as the cause of the infection in from 5 to 33 per cent of such instances, it is rather surprising that widespread virulent infections do not occur much more frequently at this particular time.

De Lee[10] states that in gonorrhea during pregnancy, due to the succulence of the tissue, the gonococcus attacks the vagina and vulvar epithelium in addition to the urethra, vulvar glands and cervix. The vagina is thick and granular like a nutmeg grater and bleeds easily on touch; the cervix is swollen, eroded and easily vulnerable. De Lee further states that acute gonorrhea in gestation can cause rheumatism, with disorganization of the joints of the wrist, knee, hip, etc., and even endocarditis and general septicemia.

Norris points out that pregnant women are more susceptible to gonorrheal infection than their nongravid sisters, because of the increased blood supply to the genital organs and the softening of these structures incident to gestation. Norris states that gonorrhea is extremly frequent in pregnancy. He quotes several observers who give us information regarding the frequency of gonorrhea in the pregnant woman. Gurd[11] isolated gonococci from the vagina of 52 out of 113 pregnant women applying at a dispensary for treatment for pelvic pain. Leopold[12] contends that 20 per cent of pregnant women have gonorrhea. Stevenson[13] found 18.4 per cent infected, in a series of 1101 pregnant women. Sänger,[14] Burchardt[15] and Lomer[16] place the figure at between 15 and 30 per cent. Zwow[17] found the gonococcus in 75 out of 130 pregnant women. More recent observers, Taussig,[18] Harrar[19] and others, find gonococci present in 5 to 10 per cent of the cases. Recently I examined smears from 100 consecutive admissions in the prenatal dispensary and was able to demonstrate the gonococcus in only 3 cases. In view of the fact that from time to time serious widespread, systemic infections of gonorrheal origin occur during the puerperium, it is very important to be ever on the lookout for gonorrheal infections in the prenatal clinic. Many clinics, no doubt, take routine smears: judging from the high percentage of

positive findings by many observers, such a procedure would seem necessary; yet it must be remembered that these reports were undoubtedly based upon a very closely observed series and not selected from ordinary routine work. We feel, therefore that a negative smear in a hurried routine course in a busy prenatal clinic gives one a false sense of security, and therefore, we have not adopted vaginal smears as a routine measure. We feel that patients presenting a local irritation, as well as any pathologic discharge, should be examined bacteriologically. Such patients should be treated irrespective of the bacterial findings, because it has been our definite experience that in many pregnant women exhibiting a marked purulent discharge, repeated examinations demonstrate no gonococci until after delivery. We further believe that the treatment in these cases should consist of some sort of an antiseptic douche, and that local treatments, such as are given in the nonpregnant state, should not be considered in these circumstances. We feel that in this way we have been giving the subject more individual attention and more effective treatment.

Among 4284 admissions on the obstetrical service of the Washington University Hospital and the Barnes Hospital, we have encountered four cases of gonococcus arthritis during pregnancy. One case developed during the puerperium. I feel that on account of the fact that apparently very few cases occurring during pregnancy have been called definitely to our attention, and also on account of the extensive involvements in these cases, the marked amount of discomfort and disability occasioned by the lesions, that they warrant serious consideration. Further, in one case there is rather definite evidence that the disease was transmitted to the child in utero. This case is of unusual interest on account of this possible transmission.

The subject of transmissibility of substances through the placenta is perhaps no more elaborately discussed than in Williams'[6] textbook. He states that at present the consensus of opinion is that bacterial transmission occurs but rarely. He quotes from Lubarsch, 1896, that organisms of anthrax, pneumonia, typhoid fever and various infections due to pyogenic organisms may be occasionally transmitted but that such occurrences are very exceptional. Typhoid bacilli are transmitted to the fetus perhaps more frequently than any other organism. In this rather extensive review, no especial mention is made of gonococcus transmission, except the note that pyogenic organisms are occasionally transmissible.

The case observed in our series is very suggestive that this infection was transmitted through the placenta from the mother who, herself, had this widespread systemic infection, because five days after birth, with no evidence of any focus of infection, the child developed

a marked swelling in both wrists and the left knee, from which two weeks later gonococci were isolated. Full details of this case will be given below and in connection with this entity may be mentioned the series of cases collected by Kimball,[20] in which he reports eight cases of arthritis and pyemia in infants ranging from two to three months of age. In these cases there was absolutely no evidence of any local manifestation of disease. Seven of these infants were males and one female. It is rather singular that in another series of 70 cases of marked vulvo-vaginitis in the same hospital, there was only one case with secondary joint involvement. He is at a loss to explain the mode of entrance of the organism in these cases. Three cases showed a mild stomatitis, from one of which a diplococcus was isolated; Kimball suggests this as a possible source of infection. The histories obtained in these cases give little or no information concerning the condition of the mother, either before or after labor. Kimball does not mention the possibility that these conditions may have been transmitted as a result of systemic infection of the mother.

CASE REPORTS

CASE No. 1.—M. B. Ob. No. 656. White. Age eighteen. Single. Gravid. 1. Admitted to the Washington University Hospital June 27, 1912. Pregnancy normal until the preceding day, when inflammation of the wrist, shoulder, knee and ankle joints, with slight swelling of the feet, were noticed by the patient. Expected date of term July 4, 1912. On admission, local examination showed a small cyst on the right labium majus and a peculiar eruption over the entire body suggestive of lues. Past history, uneventful, except that patient had noticed a profuse, creamy vaginal discharge beginning four months after the onset of pregnancy. Patient was delivered June 29, 1912, after labor of four hours' duration. July 5, knee was aspirated and the cloudy fluid thus obtained was cultured and a pure culture of gonococcus was isolated. Wassermann, July 3, 1912, was negative. July 18, left elbow became involved. Sept. 13, left knee was ankylosed; slight flexion of left leg; left foot was swollen. Patient was discharged Nov. 18, 1912. The joints, especially the hands and knee, showed some fibrosis. Pelvic examination on discharge showed a firm outlet well contracted; cervix soft, admitting one finger, with triangular tear; uterus of normal size, in second degree movable retroversion. Slight induration on each side; no tenderness, no masses. After patient had been at home for 10 days, her hip and knee became painful. Six months later, she re-entered the hospital on the Orthopedic service where treatment was continued; later arthroplastic operations were performed on the wrist and knee joints. July 3, 1912, five days after birth, the infant's wrist and left knee began to swell. No local lesions were apparently observed in the child. On July 21, the infant's joints showed fluid for the first time. Aspiration revealed a fluid from which the gonococcus was isolated. On August 10, the right knee became involved and on Sept. 13, the left elbow. Later the child developed an ankylosis of the jaw and was under the care of the Pediatrics service intermittently for about 2 years.

CASE No. 2.—C. P. Ob. No. 2162. White. Age eighteen. Gravid. I. Patient was admitted to the medical service June 1, 1918. Two weeks previously she had had pain and swelling in her right elbow,—later, in wrist and shoulder; on third

that she had had a vaginal discharge since the age of 15, there was no appreciable discharge present at this time and no smears were made for microscopic examination. Last menses appeared about the middle of Sept., 1921; date of term, latter half of June, 1922. Patient exhibited no abnormal symptoms during her monthly dispensary visits until April, 1922, when she complained of headaches and pain in her left shoulder which disappeared within a few days. On April 29, 1922, patient was visited in her home because of pain in her arms and legs elicited both on active and passive motion. Both wrists, right elbow, right metacarpophalangeal and right knee joints involved; also slight swelling of the dorsal surfaces of both wrists. Examination at this time revealed several carious teeth, acute pharyngitis and an erosion of the cervix uteri, with considerable mucopurulent discharge containing numerous gonococci. Two days later, the patient was brought into the hospital, suffering great pain in the involved joints. Past history, aside from the usual exanthemata of childhood which were free from complications, influenza four years before, and a vaginal discharge since the age of 15, patient had always been healthy. May 4, 1922, four c.c. of thick, turbid, light yellow fluid was aspirated from the right knee. Smears and cultures revealed no organisms. Wassermann negative. Gonococcus fixation-test positive, 2-plus.

June 4, 1922, child weighing 3390 grams delivered spontaneously; fed artificially without difficulty. Mother was treated with various gonococcus vaccines without any marked improvement. Joints were in splints during the acute stage. Dry heat, later, active motion applied to the joints after the acute symptoms had subsided. Pelvic examination at discharge showed the cervix closed, broad, soft; corpus well involuted, anteflexed, normal size, movable, not tender. Palpation in both adnexal regions elicited tenderness, no masses detected. Resistance of patient made examination somewhat unsatisfactory. Nothing found in pelvis at this time indicated an acute process.

July 26, 1922, patient was discharged from the orthopedic service because of leaving the city. At this time she was able to walk without support, though she stated that her right knee was still troublesome. Her right wrist had no perceptible motion; left wrist had fair motion which was increasing daily.

In going over these case records one is impressed, first of all, by the fact that the arthritis in all four cases came on in the latter half of pregnancy, and in three instances the first symptoms occurred after 35 weeks' gestation; and in two instances the patients were not observed previous to the onset of the arthritis, but in one instance the patient had been to the dispensary, being registered for a period of three months before the onset of the arthritic symptoms. No smears were made from this latter case previous to the development of the arthritis, apparently the condition having been overlooked. The third patient contracted her infection definitely between 32 and 35 weeks' gestation and had been perfectly normal up to that time. In only one instance was there any certain evidence of pelvic inflammatory disease present on discharge from the hospital. In every case, the puerperium was not in any way uneventful, aside from the arthritic involvement.

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DISCUSSION

DR. WM. M. BROWN, ROCHESTER, N. Y.—Dr. Royston I believe made the statement that the ordinary therapeutic measures that would be instituted otherwise should not be undertaken during pregnancy. I have not had much fear of that. In fact, it has been a common experience that where we have had badly infected girls come in with a profuse vaginal discharge any time during the last few weeks or few months of pregnancy, if we put these patients in the hospital, and packed the vagina thoroughly with 10 per cent formalin gauze, ten minute application every day or two, it certainly cleaned them up, and it is, to my mind, a valuable preparation for a delivery which may be imminent.

DR. JAMES E. DAVIS, DETROIT, MICHIGAN.—I would like to emphasize one point both from the standpoint of the laboratorian and clinician. The essayist has indicated that a vaginal smear is often useless. From a laboratory standpoint it is quite useless excepting where, of course, you have a positive finding, but a negative finding means absolutely nothing. Smears should be taken routinely first from Skene's glands, after the finger has been inserted so as to practically obliterate the depth of these glands from one side and then from the other, and next from the cervix. Sometimes it is necessary to exert pressure upon the cervix in order to get good smears, and thirdly, from the meati of the Bartholin ducts. Here, a certain degree of massage of the duct should be made to be sure of getting a fertile smear.