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## Diagnosis and treatment of puerperal fever

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THE DIAGNOSIS AND TREATMENT OF PUERPERAL FEVER

by

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University of Nebraska  
College of Medicine  
Omaha

LK-JHT

## THE DIAGNOSIS AND TREATMENT OF PUERPERAL FEVER

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The name, puerperal fever, was first suggested by Richard Morton in 1692 to apply to a febrile condition in puerperal women. Altho the term is not precise and as vague as the knowledge of the condition was at that time when it was first used, yet it has been retained to this day. It includes a vast number of clinical entities giving fever during the puerperium, some of which are entirely unrelated to child-birth, such as pneumonia.

Under the general heading of "puerperal infection" are now included all the various morbid conditions which result from the entrance of infective micro-organisms into the female generative tract during labor or the puerperium. The older term, puerperal fever, is at once too vague and misleading, and for many other reasons should be discarded for it takes no account of the various etiological factors which may be concerned.

In the strict sense of the term, puerperal, should be applied to an acute febrile condition occurring early in the puerperium with the pathological picture of acute endometritis which usually becomes associated with myometritis, salpingitis, parametritis, pelvic peritonitis and pelvic thrombo-phlebitis and may lead to a general peritonitis, septic, septicopyogenic or pelvic abscess.

It is probable that puerperal infection has occurred as

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long as children have been born, and passages in the works of Hippocrates, Galen, Avicenna, and many of the old writers clearly gave reference to it. As early as 1676 Willis wrote on the subject of Febris Puerperarum.

The ancients regarded the affection as the result of retention of lochia, and for centuries this explanation was universally accepted. In the early part of the seventeenth century Plater showed that it was essentially a metritis, and was followed in the next century by Puzos with his milk infection theory. From the time of Plater until Semmelweis proved its identity with wound infection, and Lister demonstrated the value of antiseptic methods, all sorts of theories were suggested concerning the origin and nature, which are comprehensively dealt with in the monographs of Eisenmann, Silberschmidt, and Burtenshaw.

Altho Charles White (1793) and Alexander Gordon (1795) clearly recognized the contagious nature of puerperal infection, and many other British observers had vague ideas upon the subject, it was not until the middle of the nineteenth century that such views were strongly urged. In 1843 Oliver Wendell Holmes read a paper before the Boston Society for Medical Improvement entitled, "The Contagiousness of Puerperal Fever" in which he clearly showed that at least the epidemic forms of the affection could always be traced to the lack of proper precautions on the part of the physician or nurse. Four years later Semmelweis, then an assistant in the Vienna Lying-In Hospital, began a careful inquiry into the cause of the frightful mortality attending labor in that institution, as compared with the comparatively small number of women succumbing to puerperal infection when delivered in their own homes. As a result of his investigation he concluded that the morbid process was essentially a wound infection, and was due to the introduction of septic material by the examining finger. Acting upon this idea, he insisted stringent orders that the physicians, students, and midwives should disinfect their hands with chlorin water before

examining the puerperal women. In spite of almost immediate surprising results -- the mortality falling from over 10% to 1% -- his work, as well as that of Holmes, was scoffed at by many of the most prominent men of the time, and his discovery remained unappreciated until the influence of Lister's teachings and the development of bacteriology had brought about a revolution in the treatment of wounds.

Puerperal infection, then, is a contact infection. This conception is definitely enunciated by Semmelweis in the following words: "I consider puerperal fever, not a single case excepted, as a resorption fever, caused by the resorption of a decomposed animal-organic material. The first result of the absorption is a change in the blood, and the exudations are the result of the change. The decomposed animal-organic material, which, when reabsorbed, causes childbed fever, is brought to the individual from without in the great majority of cases, and this infection is from without. These are the cases which represent childbed fever. These are the cases that can be prevented.

In the latter part of the eighteenth century, puerperal fever began to be recognized as a contagious malady in England. This conception apparently originated with Thomas Kirkland of Ashby in 1774, but was first clearly enunciated by Gordon of Aberdeen in his treatise "On the Epidemic of Puerperal Fever, as it prevailed in Aberdeen from December 1789, to March 1792." He states, "It is a disagreeable declaration for me to mention that I myself was the means of carrying the infection to a great number of women."

The diagnosis of puerperal infection is usually made without difficulty, as the clinical history is very significant.

If a patient who has been doing well after delivery has a rise in temperature on the third or fourth day which persists for more than twenty-four hours -- say a temperature of 100.4° F., -- we may be

practically sure that we have to deal with an infection, unless some other perfectly apparent condition will account for the symptoms. The occurrence of an initial chill adds to the probability of the diagnosis. In the old days it was believed that the onset of lacteal secretion was accompanied with fever, and the older observers were always ready to attribute a rise of temperature on the third or fourth day to this cause. At present, however, this so-called milk fever is no longer regarded as a morbid entity, as we know that the normal puerperium should be afebrile.

In uncomplicated cases of puerperal endometritis usually very little pain is complained of, and it sometimes becomes difficult to decide positively whether the temperature is due to infection or to some other cause. After the infection has become well established, either as an endometritis, peritonitis, or one of the other forms, the diagnosis is generally easy, and it is hardly possible to mistake the symptoms produced by a peritonitis or by a pyemia. In the case of parametritis and suppurative affections of the tubes and ovaries, bimanual examination will demonstrate the presence of a mass on one side of the uterus, if the tumor has not already made itself evident to abdominal palpation.

Occasionally a febrile movement may occur between the seventh and fourteenth days, which may possibly be ascribed to emotional causes, such as excitement, fright, or grief. In this event the temperature may occur with a sudden rise, and after reaching a considerable height promptly fall to normal after a few hours. Such a diagnosis is not permissible if the temperature elevation remains for twenty-four hours. Now and again a somewhat similar rise is caused by auto-intoxication from the intestinal tract. The diagnosis is readily arrived at by the administration of a purgative, for after copious movement

of the bowels the temperature falls rapidly and remains normal. Again, fever occurring in the early part of the puerperium is sometimes due to inflammatory troubles about the breasts, but the subsequent history of the cases clears up the question of diagnosis.

Many intercurrent diseases may be accompanied by chill and high fever, and temporarily making one suspect puerperal infection, although again the subsequent history clears up the diagnosis. This frequently is so in angina, acute pulmonary infection and pyelitis. Sometimes prolonged suppurative processes in other parts of the body may be accompanied by symptoms which may be confounded with puerperal infection. Malaria and typhoid fever have been confused with puerperal fever.

As the most common lesion in puerperal infection is endometritis, it is a matter of great importance to decide whether one has to deal with the septic, putrid, or gonorrhoeal variety; but, although in many cases the clinical symptoms will give definite indications, as a positive conclusion can be arrived at after a bacteriological examination of the uterine lochia has been made. In the gonorrhoeal infections the development of a purulent ophthalmia on the part of the child who has not had the silver treatment, justifies a positive diagnosis, but even in such cases one is not sure that other organisms may not be concerned.

Cultures may be taken from the interior of the uterus with comparatively little difficulty. It gives most reliable information if employed during the week following delivery, but after that period the results are not so decisive, as the uterine lochia in the latter part of the puerperium practically always contains putrefactive bacteria.

It was for a time believed, that the demonstration of the presence of hemolytic streptococci always indicated the existence of a virulent infection. This however, is incorrect as it has been demonstrated that such bacteria may give rise to benign infections, or may even be

present in healthy women, altho it must be admitted that they are frequently associated with serious infections other than the hemolytic variety.

Williams states that the bacteriological examinations of the blood is of secondary importance from a diagnostic point of view, altho it should always be made in seriously sick patients, as the demonstration of the streptococci adds to the gravity of the prognosis. It does not however, necessarily indicate a fatal termination, as he has repeatedly seen recovery occur in patients whose blood contained hemolytic streptococci, and in some instances they were but slightly sick.

The macroscopic appearance of the lochia is also of considerable value, for in the putrid endometritis the discharge is frothy and frequently very offensive in odor, while in pure streptococci infections it is very little changed from the normal. This distinction needs to be especially emphasized, since the first question which the practitioner usually asks in the presence of fever during puerperium is whether the lochia has a foul smell and if not he is apt to believe that the fever is other than of uterine origin. As a matter of fact, the reverse is almost constantly true, and as a rule the foulness of the odor is in inverse proportion to the danger to which the patient is exposed.

In considering the treatment of puerperal fever, two types of treatment are to be considered, namely prophylactic treatment and curative treatment.

In the way of prophylactic treatment Dr. H. A. Miller advocates prophylactic cauterization of cervical erosions. He and his co-workers found upon examination of 1000 post puerperal women that 90% had suffered some degree of cervical laceration and that 70% had erosions varying from mild symptomless erosions to those of a marked degree. He also found varying degrees in the virgin and from 5 to 10%



in the primiparous women.

Cultures of various erosions were made in 170 cases with results that streptococci were found in 10% of all cases, 4% being hemolytic streptococci and 8% streptococcus veridans. With the 90% of bruised, traumatized, and lacerated cervixes plus the presence of streptococcus in at least 10%, 4% of them being of hemolytic variety, Dr. Miller concludes that in these, infection should occur and would do so if it were not, that in the majority of instances the individual's resistance to the organisms is sufficient to prevent its invasion of surrounding tissues altho, always or nearly always manifested by a localized reaction.

In cauterization an existing erosion in a post-puerperal woman Miller discovered a few weeks later that he had cauterized the cervix of a pregnant woman, hence that some erosions could be healed, this nidus of infection be removed, the birth canal freed of virulent organisms and the woman freed of danger.

At first only mild cases were cauterized but later extended the cauterization to the point where bright granular areas surrounded the external os on all sides as much as one-half centimeter, but in no case did he attempt cauterization of erosion which was complicated by a laceration which extended beyond the external os, or in acute gonorrhoeal infection. He found by experience that cauterization could be done effectively during the first half of pregnancy. All patients receiving cauterization were requested to remain in bed for the first two weeks.

As a result of cauterization of 2000 cases it was found that cauterization --

First, does not prolong the first stage of labor or delay the spontaneous dilatation of the cervix,

Second, does not increase the percentage of interference by forceps, version or other procedures,

Third, no cases of sepsis occurred in the healed cervix while to the contrary, during this same period, two cases of severe sepsis occurred in patients in whom erosion was noticed as being too extensive or lacerated too deeply to permit successful cauterization,

Fourth, temperatures were remarkably flat in contra-distinction to the moderate elevations (100° or under) in the non-cauterized group,

Fifth, ante-partum cauterization of the cervix largely leaves a non-eroded (healed) cervix at the end of the puerperal period in contra-distinction to the 70% of erosions if cauterizations had not been done,

Dr. Miller states that a cervix which shows an erosion at the end of the puerperal period should be cauterized as a prophylactic measure against infection in a subsequent pregnancy to assist in correcting a residual leukorrhea, pain and discomfort in the pelvic organs, and to correct a chronic irritation which may later predispose the individual to malignancy.

No case of cancer occurred to their knowledge where they noted that the cervix was healed.

The method used in cauterization of the cervix is first to expose the cervix with a "B" valve speculum. Use an olive like bulb heated to a cherry red, apply directly to the erosion and if necessary 1/4 to 1/2 centimeter in the cervical canal, discontinuing the procedure when the patient complains of heat to the surrounding tissues or cramp in the uterus, which the patients compare to a premenstrual cramp, again resuming and discontinuing as indicated by the response of the patient.

Histological studies of the cervix show that the glands surrounding the external os to be deeper and more racemos than those near the internal os, hence more frequently infected and more readily destroyed by actual cautery and cases which have been proved by culture to harbor hemolytic streptococci have shown a negative culture 6 weeks later.

Dr. Miller states that he hopes that every pregnant woman will be subjected to a speculum examination early in her pregnancy and if erosions are found they will be looked upon a potential danger and healed.

Dr. D. H. Bessesew of Minneapolis states that morbidity can be reduced 50% in obstetrics by vaginal sterilization before delivery. He further states that the introduction into the vagina of any object, sterile or contaminated, will carry with it bacteria and this is most often accomplished thru vaginal examinations, douche nozzles, or instruments. Just how much time is required for the vagina to resume its normal state free from organisms, after contamination seems an unsettled subject. It depends probably on the number of organisms introduced, the virulence of the bacteria, the condition of the patient and the condition of the genital tract. Some authors recommend that patients refrain from coitus during the last few days prior to labor, others a period of six weeks. This must indicate that in the experience of these advisors the introduction requires approximately that interval for control.

There are two sources of bacterial invasion in the parturient patient, viz: 1. Infection present in another part of the patient's body which may spread to the labor wound thru the blood and lymph streams or by contiguity; and 2. Infection present in the birth canal already present in the birth canal (already present or introduced

shortly before labor) which may spread to the labor wound. By careful prenatal attention, every effort is made to bring to the mother thru the period of gestation with the elimination of infection in any part of her body. Accurate instructions are given her how to avoid the possible presence of infection in the vagina previous to labor, and finally, labor so conducted as to minimize the possibility of bacterial invasion during parturition and puerperium. These efforts are not without results, but an occasional case will slip thru this close attention, and infection result in a fatal outcome; and, in spite of the religiousness of our most scientific attention.

Every mother is a potentially infected maternity patient. Every mother is potentially infected. Every labor presents a wound. The mother's recuperative process, especially in the usual absence of bacteria result in a complete return to normal in a few weeks time. But if bacteria are present the mother's resistance may be taxed to the utmost.

The character of the labor has much influence on a potential infection. The presence of toxemia in a mother is a known agent for increasing the possibility for infection. A long labor with need for surgical interference adds a few points to the already high percentage possibilities of infection. Laceration of all sorts in the perineum or cervix, both of which are such common points of stress during labor, open the weakened tissues to direct bacterial action.

If the membranes rupture early or there is a placenta previa or from other causes blood is allowed to enter the birth canal before labor, there is increased likelihood of infection.

The crushing of soft parts against a deformed pelvis even without rupture of the uterus may result in direct extension of

infection to the peritoneum.

The type and number of organisms and the point of entry determines the localization and character of the infectious lesion, whether it be an abscess, phlegmon or thrombus.

Dr. D. H. Bessesew states that the time to deal with puerperal infection is before labor is accomplished, while we know we are dealing with a potentially infected field. He states that we would not undertake a surgical operation without first making every effort to destroy the bacteria which might gain entrance to the wound. Yet, we deliver patients, following which we know there will result a large obstetrical wound, thru a field which we know before hand may contain bacteria. Why should not a field which is at the outset not sterile and is about to be of a formidable injury with the expectation of exposing the body to the ravages of micro-organisms which are known to be present, be rendered as sterile as the present knowledge of antisepsis will permit?

The antiseptics which sterilize the skin may injure the mucous membrane, cause it to become swollen, parched, dry, cracked, fissured, and expose it to further invasion of the bacteria which unquestionably will grow again in larger forms and numbers when nourished back to life (after passing of the bacterial action) by the excellent culture media of the body fluids seeping thru this injured mucosa heated to optimum temperature of the body. When such strong antiseptics are applied to the obstetrical patient it is little wonder that the number of infections are increasing.

The labia minora (which have been painted) are carefully separated and the vestibule is thoroly saturated with antiseptic. Finally a clean sponge soaked with the antiseptic solution is inserted

into the vagina and the gloved sterile fingers work this well into the mucosa of the entire vaginal canal. This application may be made thru a speculum if so desired, as the leaves of the speculum iron out the rugae of the vaginal walls. If labor continues for any length of time this preparation must be repeated every eight to twelve hours depending upon the type of antiseptic solution and the length of its action.

A study of the types of antiseptics shows that at present the most advantaged drugs for sterilization are hexylresorcinol or mercurochrome. Recently a product, merthiolate, has been advanced with experimental data which place it on a par with those mentioned above. Hexylresorcinol depends for its action upon physical properties and will not act unless it comes in contact with the bacteria in sufficiently strong solutions to dissolve the germs. The other two depend on their chemical action and are germicidal in very weak solutions. Painting a 4% solution of mercurochrome over the perineum and introducing 4 c.c. into the vagina and working this gently with the gloved fingers, or a 10% solution of mercurochrome and introduce into the vagina a solution of glycerine, 5 c.c. containing enough mercurochrome to make a 5% and iodine 1%.

Williams procedure of prophylactic treatment of puerperal infection is the maintenance of strict asepsis by the obstetrician and nurse before, during and after delivery. The restriction of vaginal examinations within the lowest limits possible. The greatest possible utilization of abdominal palpation and rectal examination. The omission of prophylactic vaginal douches. The immediate repair of perineal lacerations which might otherwise offer foci of infection, and regarding the genital canal of the puerperal woman as a noli me

tangere, into which neither finger or instrument should be introduced except in emergencies.

In the way of prophylactic treatment Dr. Samuel S. Rosenfeld claims good results by the use of intrauterine antiseptics, this treatment being indicated in cases where infection is presumably present. The antiseptic of choice is neutral acriflavine, for its antiseptic coefficient is high, and its non-irritating effect even in the peritoneal cavity as a strong a dilution as 1 - 1,000. Also the activity of the flavine is not reduced by the protein solutions such as serum.

The procedure used is by placing a T tube, introduced thru the uterine incision and the lower ends brought out thru the vagina, strapped to one thigh and enclosed in a sterile towel. If delivery is effected per vias naturales, the tubes are introduced thru the cervix with dressing forceps and affixed to the thigh as above. To insure a return flow and guard against antiseptic solution entering the peritoneal cavity thru the Fallopian tubes at least two rubber tubes should be introduced in the uterus.

In discussing the curative treatment of puerperal infection, various types and methods of treatment have been advocated.

Dr. A. Remington Hobbs contends that pent up pus in the uterus should be drained as in any other surgical procedure, and not leaving the septic uterus to take care of itself. This opinion was definitely reached when it was found that in over one half of the cases of puerperal sepsis there was pent up pus.

The first point which always arises when dealing with pent up pus secretions, naturally from surgical teachings, is the question of placing a drainage tube in the parts concerned. For some time a drainage tube was left in the uterus either as a

continuous method or only for a few hours. It was found by Dr. Hobbs after considerable experimentation that after leaving the drainage tube in for twelve hours, the tube became offensive. It was thought that the tube left in the uterus acted as a sort of plug and retarded flow of lymph from the tissues. In many cases it exerted uterine contractions and caused pain because the organ was trying to expel foreign bodies which exhausted the uterine muscle.

In order to arrive at the best method of draining the uterus, two things were borne in mind. In acute cases the edematous tissues have to be drained and in the chronic cases, the secretions in the over-distended tortuous glands have to have an exit. The cervical canal must have an exit, must be kept clear of all foreign bodies and retained products. To obtain this, a suitable drug must be used without leaving in a tube. In choosing such a drug, Dr. Hobbs found that glycerine could be used again and again without being followed by an increase in fever or disease, so that each application fulfils the purpose of an aid to the drainage of tissues which are in a state of stasis, which in no way injures the living cells of the tissues which it comes in contact, which promotes lymph drainage from the infected tissues, a method which, by so doing stops secondary hemorrhage, mildly stimulating the uterus to contract and finally restores function of the uterus.

In cases following labor the patients are prepared in the usual way, but after insertion of the catheter into the uterus leaving it in situ. A syringe affixed to the catheter is placed on a sterile pad on the symphysis pubis. Glycerine is injected slowly thru the catheter, giving slow irrigative treatment to the uterus and this may be continued from twenty minutes to one-half hour. In that time sixty to a hundred c. c. may be given twice per day.



In many cases after the first or second irrigation the temperature has fallen by crisis. This has been used in chronic cases with remarkable results and many hopeless cases have cleared up.

Dr. S. A. McSwinney states that, Dr. Remington Hobbs' method of treating puerperal sepsis by the injection of glycerine into the uterus, is generally agreed a very valuable addition to our armamentarium in fighting the dread disease. It depends on its highly hygroscopic action of the glycerine which induces an increasing flow of serum into the uterus.

Dr. W. A. Dafoe of Toronto General Hospital believes that the essential part of the whole question of treatment of puerperal fever is that, the measures used should be begun as early as possible. In order to do this there must be a systemic plan of investigation in every case of temperature in puerperium. This plan of investigation should include a culture of the cervical discharge and this procedure should never be neglected. Besides the general and the non-specific measures of treatment, which are fairly well known, he has used since 1926, scarlet fever antitoxin as a special measure in the treatment of puerperal fever when it is due to streptococcus hemolyticus. He chose this serum because of its immunizing power against one of the family of hemolytic streptococcus. A specific type of streptococcus hemolyticus has never been proven to be the cause of puerperal fever. If this is true, it would be impossible to produce a specific serum against puerperal fever. The value of scarlet fever serum may be due to a non-specific unmeasurable power which is shown by beneficial clinical results, a production of immune antitoxic bodies, or stimulation of various defensive powers of the blood stream such as the opsonic and phagocytic power of the white blood corpuscles and bactericidal power of the serum.

It would appear then, that the stimulating power of this defensive mechanism is the most natural method of combating in a special way an infection of this nature.

The conclusions from this type of treatment of Dr. Dafoe are as follows:

1. 32% of the morbidity in cases reported were due to puerperal fever and in over 50% of these the hemolytic streptococcus was the causative organism.
2. Streptococcus hemolyticus was found to be seasonal in appearance and occasionally present in the genital tract during pregnancy, more often during labor, and most often in the puerperium.
3. Streptococcus hemolyticus when found in the cervical canal during the puerperium is always a source of danger.
4. Early investigation and immediate treatment is essential.
5. Scarlet fever antitoxin has a specific value in the treatment of puerperal fever and post abortal cases of sepsis due to streptococcus hemolyticus.

The therapeutic value of an antitoxin is dependent on its specificity, potency and lack of serum reactions. The puerperal fever streptococcic antitoxin possess specific value in acute endometritis with septicemia due to hemolytic streptococcus. There is also a favorable response in the non-hemolytic infection. Its potency as determined by antitoxic neutralization and by comparison with that of scarlet fever antitoxin of known therapeutic value shows a titer equal to that of scarlet fever antitoxin. The antitoxic power increases with further immunization of animals.

Dr. Lash of Chicago, has come to the following conclusions in regard to the use of concentrated streptococcus antitoxin in the treatment of puerperal fever.

1. Small doses of concentrated antitoxin achieving favorable clinical therapeutic results without immediate reactions is evidence of a specific reaction rather than a non specific reaction.

2. Further evidence of the therapeutic specificity is adduced by the fact that with the increasing potency of the serum correspondingly smaller doses with equivalent results.

3. The larger amounts of serum used in the earlier experiments were probably superfluous as the only index then used for the repetition of the dose was fever rather than the condition of the patient.

4. To use fever as an only guide of serum therapy may be necessary since the antitoxin may overcome the toxemia and thereby allow the leucocytes to overcome the streptococci without an immediate drop in fever.

5. In spite of the hyperpyrexia the general improvement of the patient influences the diffuse mechanism favorable, permitting thereby the localization of the infection to the pelvis.

6. Immediate reactions are unaccompanied with the concentrated antitoxin and serum sickness occurs only when larger doses have been used which are necessary at times. The serum sickness can be controlled by drugs.

7. In addition the antitoxin is not harmful, having no irritating effect as no symptoms arose indicating any disturbance of the kidney or other parenchymatous organ.

8. Since this antitoxin is comparable in its efficiency in the treatment of puerperal fever with diphtheria, scarlet fever or tetanus antitoxin, a woman developing symptoms of puerperal fever with decided temperature elevation should receive it within 36 to 48 hours, after the onset. Just as antitoxin is of little, if any, value in peritonitis, in scarlet fever so with advanced puerperal fever the administration of antitoxin serum is practically valueless.

9. Since severe and even fatal doses may appear mild at the onset and since heretofore there has been a tendency to withhold the

antitoxin until it is apparent that the prognosis is unfavorable, it is well to give the antitoxin in the early cases.

10. The comparison of mortalities in the group of patients receiving antitoxin in (32%) and the control group (61%) shows evidence of therapeutic value of the puerperal fever antitoxin.

Other attempts of treatment have been made in the treatment of puerperal fever, of which bone marrow stimulation by injection of pituitrin and intravenous glucose is described by Dr. J. Hofbauer. He found that by a combination of the glucose with the intravenous administration of pituitary extract, a vigorous stimulation on the bone marrow of puerperal women can be evoked. Further more, in view of the fact of the pronounced rise in the number of red blood corpuscles, lymphocytes and platelets in the blood which is maintained for a considerable length of time. He also found that transfusion preceded by an injection of pituitrin renders better service in the septic process than when used alone. Glucose as a stimulant of phagocytic tissue elements appears to be of particular value in those cases when a tendency toward localization of the infection in the parametrium becomes manifest.

Polak states "In parametrial cases it is surprising how these patients when boosted along with transfusions and pituitrin have improved. Stimulation of pituitary gland or intramuscular use of pituitary extract in conjunction with repeated small transfusions of blood are now accepted as rational aids in the stimulating natures supporting processes.

Case Reports.

Case 1. Patient entered the hospital complaining of pain in the lower left side of the vulvar region, soreness in the left side of the abdomen, yellowish vaginal discharge and fever. Patient had delivered a baby one week before entrance to the hospital. She was in labor for 21 hours and had low forceps applied. Her trouble began 5 days after delivery, her condition became worse so was sent to the hospital.

Examination revealed no special findings except for some tenderness over the entire abdomen and a scant, yellowish vaginal discharge.

Laboratory findings.

Blood. R.B.C. 4,860,000.

W. B. C. , 24,100.

Hb. 85%.

Urine. SpGr. 1.024 , Alk, Albumin 1.4

Microsc. pus cells, Few granular casts.

Wasserman- Neg.

Blood Culture- Hemolytic Strep.

On admission the temperature was 102 and rose to 105.8 on the third day. The temperature never went to normal during the course. The temperature range mostly between 103-105. Pulse varied from 120-160. Respirations 25-40. The patient was alkaline given fluids and antistreptococcal serum without results.

On autopsy most all of the vital organs showed toxic degeneration. Uterus reached to the level 1/3 distance between the level of the pubis and umbilicus, markedly anteflexed, hard in consistency and of pale color without areas of discoloration. On section the uterine musculature was studded with small shot sized yellowish masses about 1/2 cm. apart, distributed uniformly thru out the myometrium. The -

was softened, reddish and somewhat cream colored, easily separable membrane of about 2mm in thickness.

Case 2.

Patient entered the hospital with a temperature of 103.4, pulse 160 and respiration of 48. The patient was placed immediately upon Sodium Citrate and quinine. A chill followed. Previous to her hospital entry the woman gave birth to a healthy boy. The labor was difficult and tedious. Labor lasted 20 hours. Symptoms of puerperal fever developed three days after delivery. Three days after delivery she developed a fever and was given 350 cc of antistreptococcic serum after which the temperature dropped to normal. After three days in the hospital she again developed a temperature of 104.4 which soon dropped to 101.6.

On examination

On examination it was found that the patient had a second degree laceration, foul smelling, copious, greenish lochia, edema of the vaginal wall and a bilateral laceration of the cervix. General rigidity of the perineum and pelvic structures. Abdomen rigid more marked in the left lower quadrant. Also distended with evidence of cellulitis low down on the left side.

Fluids were constantly forced with intravenous glucose. The heart began showing signs of decompensation and finally failed.

Case 3.

Mrs. B. entered the hospital having labor pains every 4 - 5 minutes lasting 45 - 50 seconds. Patient was in labor for 20hrs. after delivery. After delivery patient maintained a temperature of 98.6 - 99 for two days. Then she began running a septic temperature up to

103 having chills with moderate amount of pelvic soreness. Patient was known to have a smear of the cervix positive for Gonorrhoea. In a short while she began having a slight vaginal discharge. 5 days after delivery, patient began having general abdominal pains and a temperature ranging between 105 - 106.2. A vaginal examination at this time revealed a large bilateral cervical tear with pus escaping from this opening. There was no evidence of bulging in the Cul-de-sac.

10 cc of sterile milk was injected intramuscularly. The following day 500cc of whole citrated blood was given intravenously.

On the 9th day post partem patient had a temperature of 103 and course rales were heard in the chest. 1000cc of 4% glucose was administered subcutaneously. Patient died 3 hours later of cardiac failure.

At autopsy there was revealed a general peritonitis and all the vital organs were edematous and showed toxic degeneration. The endometrium of the uterus was very necrotic extending down to the cervix. Patient's case was diagnosed as a prenatal infected cervix and uterus due to the gonococcus complicated with peritonitis.

Case 4.

Patient entered the hospital with the complaints of vomiting, gripping pains in the lower abdomen and vaginal bleeding. Previous to this time patient admitted taking medicine by mouth to produce an abortion. She began having the above mentioned complaints after taking the medicine. She had these symptoms for one month previous to her entry to the hospital at which time she had taken the medication.

Her temperature for the first three days while in the hospital was between 98.6-99.2. Upon entrance to hospital examination revealed a very tender abdomen low over the tubal areas. Tenderness was elicited in the vaginal wall and both fornices. On the third day patient was to receive a curettage, but due to a chill and a rise in temperature it was thought better to wait a few days. After two days the patient was curetted and considerable amount of bloody placental tissue was removed. The uterus was packed with iodoform gauze. Four hours after curetment patient developed another chill temperature raising from 98.4 to 100.4. Four days previous to this daily blood counts were taken and the leucocyte count rose from 11,050 to 28,000. After this last sudden rise of temperature the patient appeared more toxic and in another hour died of cardiac failure.

#### Conclusion.

Pregnancy with its complications is of the second greatest cause of death for women between the ages of 19 - 25 years of age. Six or seven women out of every thousand die from causes directly related to pregnancy, and puerperal fever makes up the greatest number in this maternal mortality. This large number of deaths due to puerperal fever is due mainly to the lack of education on the part of the laymen, lack of prenatal care, and lack of an aseptic conscience on the part of the nurse, midwife or doctor.

A diagnosis of puerperal fever is made without difficulty as the clinical history is quite significant. A temperature of 100.4 lasting for more than 24 hours with a lochia usually more increased becoming less foul smelling as the virulency of the



organism increases. The occurrence of an initial chill adds to the probability to the diagnosis.

Prophylactic treatment is the present stronghold for the limitation of the occurrence of puerperal fever, it being very simple and confined to rigid asepsis, limitation of vaginal examinations, preventing, limiting and repairing injuries to the birth canal and proper aseptic preparation for delivery.

Curative treatment should consist of drainage of pent up pus and infected body secretions, forcing of fluids, glucose and saline intravenously, blood transfusions, protein reactions, vaccines and serums and narcotics for rest of the patient.

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