

SOME OBSERVATIONS ON SEPTIC ABORTION

(Analysis of 617 cases—from January 1967 to June 1971)

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Since the dawn of recorded medical history, induced abortions have been repeatedly described and the oldest abortifacient recipe is said to date back to nearly 4,600 years and it involved the use of mercury. The famous historical writings of Greece and Egypt show that the procedures for inducing abortion were well known to the people even during the ancient times.

Both, spontaneous and induced abortions, have always been and still continue to be a problem to women and perhaps very few conditions in obstetrics pose so much of a challenge to the obstetrician as the management of induced abortion and its complications. In recent years, septic abortion has received increasing attention all over the world as this has become a leading cause of maternal deaths in the developed countries.

There is a marked increase in the incidence of septic abortion in Government Hospital for Women and Children, Egmore, Madras, during the last few years and nearly three fourths of the abortion deaths are due to septic abortion. We present below, certain aspects of septic abortion cases treated in our

hospital during the 4½ years period from January, 1967 to the end of June, 1971.

Definition

The term septic abortion indicates cases where the endometrial cavity and/or its contents are infected by any means. There is no universal and standard definition as to which cases should be labeled as septic abortion. While history of interference, offensive vaginal discharge, uterine and adnexal tenderness and signs of peritonitis give a definite clue to the diagnosis, often, febrile response may be the only indication of infection. Hence, many authors consider temperature elevation alone without other evidence of sepsis as an indication of utero-placental infection and treat them as septic abortion, provided other causes of fever can be excluded.

Incidence

During the 4½ year period there were 617 cases of septic abortions out of 10,472 total abortions, giving an incidence of 5.8%. Table I shows the year-wise incidence of septic abortions. It will be seen from this table that even though the incidence of total abortions remains more or less steady, the incidence of septic abortions has markedly increased over the years. In 1970 and 71, the incidence was 4 times more than 1967.

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TABLE III
Clinical Features

Symptoms and signs	Percent
Fever with history of interference	26.8
Fever and tenderness in the uterus or fornices	23
Classical signs	16.8
Fever alone	13.5
Fever and foul discharge	7.9
Shock and/or peritonitis	6.7
Offensive discharge alone	6.2
Tenderness and history of interference	5.8
History without other signs	4.8
Discharge and tenderness	4.47
Tenderness alone	4.3

plained of fever and passage of products of conception. The classical signs of septic abortion includes fever, foul smelling vaginal discharge and uterine or adnexal tenderness. This was present only in 16.8% of cases. Fever with a history of interference was encountered in 26.8%. 13.5% had only fever without other signs. In 4.8% there was a history of interference but no other signs. 6.7% were diagnosed because they admitted for shock and/or peritonitis. Apart from these, there were a combination of other signs, like fever and adnexal tenderness, fever and foul discharge, etc. etc.

Size of the Uterus

In 56.5% the uterus was 12 weeks and below, in 27% between 12 and 20 weeks and in 6.9%, 20 weeks or more. In 9.4% the size was not made out.

Type of Abortion

30% were threatened abortions and 60%, incomplete or inevitable ones. The remaining 10% were thought to be complete.

Management

Cases with a history of interference and suspicion of sepsis were immediately

started on antibiotic therapy. The antibiotic of choice has been chloromycetine, intravenous or intramuscular. Penicillin and tetracyclin have been used in a few cases. Corticosteroids have been used as a routine in seriously ill patients and cases with hypotension. The uncomplicated cases were not given corticosteroids for prophylaxis. Proper supportive therapy with intravenous glucose or blood was given when necessary.

Patients whose general condition was good and infection localised to the uterus were evacuated soon after the temperature came down with antibiotic therapy. In the absence of bleeding, cases with complications like peritonitis or shock were treated conservatively until the blood pressure was restored to normal and the infection cleared up completely. Curettage was not done and surgery was not resorted to.

In 60% of cases the os was open on admission and out of this 62% were evacuated within a few hours, 18% within 24 hours and 20% after 24 hours. The average duration of waiting in the last group was 3.7 days with a range of 2-12 days. Average duration of hospital stay was 5.6 days. 40% of cases were admitted with closed os and out of this 10% were thought to be complete and the remaining 30% were threatened abortions. Of this, 41.3% were evacuated, 9.8% expelled the products spontaneously and 12% were discharged against advice. The average duration of waiting before evacuation was 3.2 days and average total duration of hospital stay was 6.5 days. If all the cases were considered together the average duration of stay was 8.4 days, range being 1-46 days.

Complications

Septic abortion can be complicated by local or disseminated lesions. Local

lesions involve the vagina, cervix, uterine contents, myometrium, adnexae, pelvic supporting tissues, peritoneum and surrounding pelvic organs.

Disseminated Lesions

These include the systemic effects of septicaemia and septic shock with its associated renal manifestations and intravascular clotting phenomena. Other widespread manifestations of septic abortion are caused by embolization or by the effects of a variety of poisons and drugs used in the attempt to induce the abortion. Since virulent bacteria are circulating in the blood stream, embolic abscesses can occur and bacterial endocarditis is a common complication of septicaemia.

In 163 cases i.e. in 26%, complications were encountered. These are shown in Table IV. The commonest complication

TABLE IV
Complications

Complication	Percent
Hypotension	9.9
Peritonitis	7.3
Peritonitis with hypotension	2.5
Tubo-ovarian mass and pelvic cellulitis	2.5
Tetanus	0.65
Oliguria	0.66
Pulmonary oedema	0.65
Gas gangrene	0.32
Pulmonary embolism	0.16
Jaundice	0.16
Hyperpyrexia	0.16
Coagulation failure	0.16

was hypotension in 9.9% of cases. Patient having a systolic blood pressure of 80 mm of Hg. or below and a diastolic reading of 60 mm of Hg. or below were considered as having hypotension. Peritonitis occurred in 7.3% and shock with peritonitis in 2.5%. 46.6% had general peritonitis and 53.3% pelvic peritonitis. Tubo-ovarian mass and pelvic cellulitis

were met with in 2.5%. There was one case of pelvic abscess diagnosed by col-pocentesis. Other complications met with were tetanus—4 cases, (0.65%), oliguria—5 cases (0.75%), pulmonary oedema—4 cases (0.65%), pulmonary embolism—1, jaundice—2, gas gangrene—2, transient coagulation defect with haematuria in 1 and one case showed features of septicaemia with bone marrow depression. There was one case of perforation of the uterus at the level of the internal os due to interference outside.

Shock is a condition of inadequate perfusion of tissues characterized by hypoxic tissue damage and metabolic acidosis. In most series, 1-4% of septic abortion cases are said to develop septic shock. In this series, hypotension occurred in 77 cases. This gives an incidence of 12.5%. Excluding 18 cases of haemorrhagic hypotension, the incidence of septic shock was 9.5%. Sixteen of these were associated with general or pelvic peritonitis. 12% were primiparae and 24% were gravidas II to IV and the remaining were gravidas V and above. History of interference was present in 72% of cases. 65% had hypotension on admission. 13% developed it after evacuation, 22% developed after spontaneous expulsion. In 65%, it occurred when the products were inside the uterine cavity. 54% had fever while 46% were afebrile.

In 66% the os was open on admission and 34% had closed os. 50% of the open os cases were evacuated after 24 hours, the maximum waiting period being 7 days. Average hospital stay for patients with shock was 8 days with a range of 3-41 days.

Management of Septic Shock

The principles of treatment are to control the infection, remove the source of infection, restore an effective circulating

blood volume and attempt to correct the micro-circulatory, metabolic and haematologic disturbances. Once the possibility of septic shock is suspected, bactericidal antibiotics should be given in adequate doses. The quantity of intravenous fluids given during the first 24 hours is a matter of much concern because in the presence of an uncertain urinary output excessive intravenous fluids may result in overloading of the vascular system and consequent pulmonary oedema. Hence, to decide accurately the fluid load which the circulatory system can withstand, CVP monitoring is said to be of utmost importance. The use of steroids and vasoactive drugs are more controversial but have their use in selected patients. Surgical drainage of abscesses, early dilatation and curettage to remove infected products of conception and hysterectomy in non responding patients are of extreme importance.

In this analysis chloromycetin, intramuscularly or intravenously, was used in 86% of patients and in 14% tetracycline was used during the earlier years. Penicillin also has been used along with chloromycetin in a few cases and in 2 patients ampicillin has been used. Corticosteroids were given routinely in cases of septic shock and found to be very useful. They are said to block the intense sympathomimetic action of endotoxin, decrease the clinical toxicity and permit survival long enough to allow benefit from antibiotics and supportive therapy. We are not much in favour of using vasopressors. Noradrenaline and mephantoin have been used only in 10% of cases in these years and during the whole of 1970 and upto end of June 71 only 1 case had this. In no case, vasodilators were used.

Mortality in Septic Shock

There were 8 deaths out of the 58 cases

of septic shock, giving a mortality rate of 13.6%. All except one death occurred in cases with general peritonitis.

Coming to the other complications, in about 10% of cases, infected abortions were associated with peritonitis. Out of this 47% were general peritonitis and 53% pelvic peritonitis. Patients with general peritonitis were critically ill on admission. Initial treatment consisted of intensive intravenous antibiotic therapy, careful fluid and blood replacement and other conventional forms of treatment of peritonitis.

Some prefer to treat patients with peritonitis conservatively while others, reporting on a large series of patients have employed prompt laparotomy and hysterectomy with or without removal of adnexae with reasonably good results. In no case, laparotomy was attempted in this series. Peritonitis carried a mortality rate of 20% but when associated with shock, the mortality rose upto 43%. All the deaths were in cases of general peritonitis and there were no deaths when only the pelvic peritoneum was involved.

Renal Failure

Another challenging problem that can arise in cases of septic abortion is acute renal failure. In this series, there were 5 cases of oliguria with 2 deaths giving a mortality of 40%. These cases survived because of early detection and timely treatment. The other 2 cases admitted with oliguria were from outside and died soon after admission.

There were 4 cases of tetanus, out of which 3 died.

Both cases of *Cl. Welchii* infection were lost.

Intravascular coagulation does not seem to be a major problem in our cases of septic abortion as there was only one case with transient coagulation defect

which was easily corrected with blood transfusion.

Morbidity in Septic Abortion

Excluding maternal deaths and those who were discharged against advice, the average duration of stay in the hospital was 8.4 days (range being 1-46 days). Out of this, 104 cases had stayed in the hospital for more than 7 days and the average stay for this group was 13.6 days. This group of prolonged morbidity comprised of cases who had persistent pyrexia and peritonitis.

Duration of Pyrexia

70% of patients had pyrexia of varying duration and the average duration of fever was 3 days. In 9% the temperature lasted for more than 5 days, the average duration of fever in this group being 8.9 days.

Maternal Mortality in Septic Abortion

During these 4½ years, there were 35 maternal deaths out of the 617 cases of septic abortion and this gives a mortality rate of 5.5%. The mortality rate in primiparae was 12% and 4.6% in multiparae. History of interference was obtained in 73% of cases.

Nearly three fourths of the deaths due to abortions were cases with sepsis. In 1968 and 1969 septic abortion deaths contributed to about 15% of the deaths due to direct obstetric causes, while in 1970 and 1971 the corresponding figure was about 25%.

The mortality in each complication has already been mentioned.

Comment

The problem which arouses most interest and controversy is that of management of septic abortions. There are two

schools of thought in the management of septic abortion namely expectant line of management, in contrast to aggressive surgical therapy. While there is general agreement about medical and supportive therapy with blood, fluid, electrolytes and massive antibiotics, there is no uniformity of opinion as to the timing of surgical intervention in the acutely ill patients. The traditional non intervention policy was based on the idea that within 62-96 hours of infection, a leukocytic barrier forms in the uterus and in order to allow the effective formation of this body defence mechanism and avoid the risk of disseminating infection, it was believed that uteri with infected abortions should not be curetted for 72 hours.

Authors like Moritz and Thomson (1966) and Goodno *et al* (1963) advocate the conservative approach. They feel that evacuation of the uterus should be done only when the patient has been afebrile for atleast 12-24 hours, unless there is uncontrolled bleeding or obvious failure of medical management and surgical management is indicated. They report an average hospital stay of 6.3 days.

On the other hand, authors like Speroff (1966), Schwarz (1968) and Cavanagh (1964) favour aggressive surgical management and practice early evacuation of the infected uterine contents after 12 hours of antibiotic therapy even if the patient is febrile. The advantages claimed are that the hospital stay is reduced and the incidence of septic shock could be minimised.

As patients with septic abortion are prone to bacterial shock, early surgical intervention for removing the source of infection is gaining more and more importance in recent times. This early curettage may occasionally be followed by chills and sharp rise of temperature but, even then recovery is said to be rapid. In

the presence of parametritis, Schwarz recommends an initial conservative approach with antibiotics and fluid replacement. If there is progressive improvement, curettage is delayed until all evidence of extrauterine disease has cleared. On the other hand, if there is persistent fever and pelvic tenderness, or endotoxic shock develops, evacuation has to be undertaken.

Regarding antibiotic therapy, it is advocated that penicillin should be administered intravenously in doses of 10-15 million units per liter followed by 5 million units every 4 hours upto a total of 40 to 60 million units per 24 hours. Streptomycin is given in doses of 0.5-1 gram intramuscularly twice daily. Along with penicillin and streptomycin, some use intravenously chloramphenicol, 1 gram initially, followed by 500 mgs. every 4-6 hours depending on the condition of the patient. In patients who are not responding to the above antibiotics and temperature continues, one has to presume the possibility of tubo-ovarian abscess or it might be that the organisms are not responding well to the above antibiotics. Hence, change of antibiotics becomes mandatory. Antibiotic sensitivity test should be done if the organism has been identified. Kanamycin, is said to be the agent of choice for gram negative organisms that have not been specifically identified and it has been combined with penicillin or the cephalosporins to cover the possibility of associated coccal infections. Kanamycin can be given in an initial dose of 500 mgs. followed by 250 mgs., 8 hourly intramuscularly. This can be continued depending on the urinary output as the drug has got a nephrotoxic effect.

Ampicillin has been used alone or in combination with chloramphenicol or kanamycin with good results. Cephalo-

sporins are bactericidal against many gram negative and positive organisms and are well tolerated by patients with marked reduction in renal function. It can be used upto 1 gram intravenously every 2 hours.

Routine initial bacteriological studies of the exo or endocervical and/or endometrial swabs and blood culture are advocated by all. But at the same time every one agrees that such culture are of limited immediate value. Secondly, the cervical culture usually shows a mixed infection and only very rarely pathogens are isolated from the blood. In a study conducted by Knapp *et al* (1960), the uterine cultures in 61 septic abortion patients were compared with the uterine and cervical cultures of 55 non septic abortion cases. In 77.4% of the cervical cultures of the non septic control group, organisms were obtained and only in 22.6% there was no growth. The corresponding figures for the septic group was 93% and 7%. Staphylococci were more prevalent in the control group and streptococci appeared more commonly in the septic group. The incidence of gram negative rods was 23.8% in the septic cases, while 11.3% of the non septic control group also showed gram negative organisms. In Goodno's study though he took cervical cultures in 153 cases, in many, the treatment was completed and patients discharged before the culture report was available.

The importance of the culture is found in those patients who do not respond to therapy within 48-72 hours. It has been suggested that since therapy should not be delayed till the culture report is available, smears of the cervix should be taken along with the culture and examined after gram stain. The course of treatment might be altered if the predominating

organism is a gram negative bacillus or a gram positive rod or spore bearing member.

Failure of response to therapy might denote complications necessitating surgery like, pelvic abscess, tubo-ovarian abscess and its rupture producing general peritonitis of a suppurative pelvic thrombophlebitis. Cul-de-sac aspiration would be of help in such cases. If blood is found, it is a presumptive evidence of perforation and purulent material usually denotes a leaking abscess or a pyosalpinx and all these suggest a laparotomy. The possibility of the use of an inappropriate antibiotic also should be thought of.

The decision for hysterectomy is influenced by the parity of the patient. In patients in whom further reproduction is not necessary, consideration should be given to prophylactic hysterectomy as the primary treatment. In the following groups of cases, hysterectomy has been advocated, (1) induced abortion with recent intrauterine injection of chemicals and pastes, (2) clinical deterioration with shock, fever, falling blood pressure and oliguria, persistent tenderness of the uterus and foul vaginal discharge, (3) a large tender uterus specially with closed cervix or *Cl. Welchii* infection. Bilateral salpingectomy should always be done with hysterectomy.

Delay in diagnosis and institution of therapy, inadequate and inappropriate antibiotic therapy and delay in the timing of surgical intervention, can contribute to the mortality and morbidity of septic abortion cases. Several authors report that surgery in selected cases has been life saving. Hence, it is felt that the present trend should be in favour of laparotomy in certain selected cases and

change of antibiotics where no satisfactory response has been obtained.

Summary

(1) 617 septic abortion cases admitted during the 4½ year period, 1st January 1967 to 30th June 1971, in the Government Hospital for Women and Children, Egmore, Madras, have been analysed.

(2) The incidence of septic abortion was 5.8%.

(3) 48% of cases gave history of interference.

(4) In 26% complications were encountered. Incidence of septic shock was 9.5%.

(5) Mortality rate was 5.5%.

(6) Average duration of hospital stay was 8.4 days.

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