Original Article

Septic Abortion Managed in a Tertiary Hospital in West Bengal

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ABSTRACT

Background: Septic abortion is still a challenging problem and a major cause of maternal mortality and morbidity in developing countries. **Aim:** The present study was conducted to estimate incidence, causes, risk factors, associated microorganisms, and treatment modalities of cases of septic abortion managed in a tertiary health care in West Bengal. **Subjects and Methods:** It was a cross-sectional study carried out in Burdwan Medical College and Hospital in West Bengal between July 2011 and June 2012. On admission a thorough history was taken, examination was done, and investigations were carried. Depending on the examination findings the cases were grouped into three grades-grade I: The infection localized in the uterus; grade II: The infection spread beyond the uterus to the parametrium, tubes, and ovaries or pelvic peritoneum; grade III: Generalized peritonitis and/or endotoxic shock or jaundice or acute renal failure. Statistical analysis was done by using Epi Info™ software (Version 3.5.1, CDC) after proper arrangement of all the data in tabular form and presented as simple percentage. **Results:** During the period, 1297 cases of abortion were admitted among which 107 were septic abortions, thus giving the incidence of the latter as 8.2% (107/1297). Forty-three percent cases of septic abortion (46/107) were in grade I, 21.5% (23/107) in grade II, and 35.5% (38/107) in grade III. The modal age group of the patients was 15-25 years (49.5%). Majority of the subjects were married (77.6%; 83/107) and multiparous (60.7%; 65/107). Similarly, most of them (71%; 76/107) were from low socioeconomic class. Ninety percent of the patients (96/107) had induced abortion. The common clinical features at presentation were pallor (88.8%; 95/107) and fever (86.0%; 92/107). *Escherichia coli* (62.6%; 67/107) and *Klebsiella pneumonia* (32.75%; 35/107) were the most common organism isolated. The case fatality from septic abortion in this study was 13.1% and the condition accounted for 15.4% of total maternal mortality within the period reviewed. **Conclusion:** The incidence of septic abortion in this study is relatively high, and majority of the cases resulted from attempted termination of pregnancy. It is a significant contributor to maternal mortality. Promotion of family planning and legalization of abortion services will go a long way in reducing the incidence of septic abortion and its associated complications.

KEY WORDS: Asia, management, maternal mortality, outcome, septic abortion

INTRODUCTION

Abortion associated with clinical evidence of infection of uterus and its content is usually considered as septic abortion. Clinical features of the condition include pyrexia, offensive or purulent vaginal discharge, and other evidence of pelvic infection.[1-3]

Although abortion has been legalized in India for more than three decades, but unsafe abortion continues to be a major contributor to maternal mortality and morbidity in the country, accounting for 15-20% of maternal deaths.[2] Poverty, restrictive abortion laws, and uncontrolled growth of unqualified abortionists, both in urban and rural areas, contribute to the high incidence of septic abortions.[1-5]

Incomplete and missed abortions are particularly prone to sepsis because of retention of nonviable product of conception, which are good culture media for microorganisms. In septic abortion, the predominant microorganism are anaerobic bacteria and coliforms.[1-3,6,7]

Endotoxic shock usually follows infection with Gram-negative organisms. Septic shock is extremely important to clinicians, as other than cardiogenic shock, it is the most common cause of shock-related deaths.[1,7] Special features of septic shock are high fever, marked vasodilatation throughout the body, high cardiac output, sludging of blood, disseminated intravascular coagulation. Clinical findings are a consequence of metabolic and circulatory derangements due to systemic infection and release of toxins, e.g., the

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endotoxin of Gram-negative bacteria or the exotoxins and endotoxins of Gram-positive bacteria.[1-7]

They stimulate the release of cytokines including Interleukin-1 and tumor necrosis factors-α, from tissue macrophages. Tissue factor expression and fibrin deposition are increased. Nitric oxide, a powerful vasodilator, is released. Hemodynamic changes occur in two characteristic patterns: Early or hyperdynamic septic shock or late or hypodynamic septic shock. Multiple organ dysfunction syndromes may develop. If the shock condition does not improve, the patient passes clinically to the stage of "irreversible shock."[1-3]

The present study was conducted to determine the incidence, causes, risk factors, treatment, microorganisms associated with septic abortion, and maternal complications of the condition in a rural setup of a densely populated developing country.

SUBJECTS AND METHODS

This cross-sectional study was conducted in a tertiary care hospital in a rural setup in West Bengal in a time span of 1 year between July 2011 and June 2012, after obtaining approval of the ethical committee of the Institution. Written consent was also obtained from the patients. Inclusion criteria: All patients with clinically diagnosed/ suspected cases of septic abortion who came to Burdwan Medical College and Hospital for treatment were included. The diagnostic criteria used for septic abortion were as follows: Rise of temperature of at least 100.4°F (38°C) for 24 hours or more, pulse rate of 100-120/minute or more, offensive or purulent vaginal discharge, and evidence of pelvic infection.[8-11]

On admission, a thorough history was taken and clinical examination was done. The following investigations were carried: High vaginal/cervical swab for culture of organism and antibiotic sensitivity test, urine for albumin, sugar, microscopy, culture and sensitivity test, blood for complete hemogram, coagulation profile, liver function tests, sugar, urea, creatinine, VDRL test, HIV I and II, electrolytes, blood gases. Other investigations done were straight plain X-ray of abdomen, ultrasonography of abdomen, chest X-ray, and electrocardiography. Pus from the peritoneal cavity was collected in sterile test tube directly and was sent for bacteriological examination in cases that underwent posterior colpotomy or laparotomy. Blood culture was done in cases who did not respond to antibiotic therapy or where there was persistent tachycardia and pyrexia.

Depending on the examination findings, the cases were grouped into three grades. Grade I: Infection localized in the uterus. Grade II: Infection spread beyond the uterus to the parametrium, tubes, and ovaries or pelvic peritoneum. Grade III: Generalized peritonitis and/or endotoxic shock or jaundice or acute renal failure. Statistical analysis was done by using Epi Info™ software (Version 3.5.1, CDC) after proper arrangement of all the data in tabular form and presented as simple percentage.

RESULTS

During a period of 12 months, 28,012 patients were admitted to the Department of Obstetrics and Gynaecology of Burdwan Medical College and Hospital in West Bengal, of which 1297 (4.63%) were cases of abortion. Of these 1297 cases, 107 were septic abortion cases. Rate of sepsis among abortion cases was 8.24% (107/1297) and prevalence of septic abortion among total number of admission was 0.38%. Forty-six cases (43.0%; 46/107) were in grade I, 23 (21.5%; 23/107) in grade II, and 38 (35.5%; 38/107) in grade III.

Some sociodemographic data are shown in Table 1. Of the 107 patients, 83 (77.6%were married, whereas 12 (11.2%were unmarried. Seventy-six patients (71.0%; 76/107) were from lower socioeconomic class.

Sixty-nine patients (64.5%; 69/107) had abortions in the first trimester, 38 of 107 (25.5%) had it in the second trimester. Rural and urban distribution of cases was as follows: Rural-66 of 107 cases (61.7%) and urban-41 of 107 cases (38.3%). Among the 97 cases of induced abortions, 15 (15.5%) were performed by qualified personnel, whereas the rest (84.5%; 82/97) were performed by unqualified personnel.

Bacteriological examination revealed that *Escherichia coli* (62.6%; 67/107), *Klebsiella pneumonae* (32.7%; 35/107), and *Staphylococcus aureus* (26.2%; 28/107) were the most common organisms isolated, as shown in Table 2.

The common clinical features at presentation are shown in Table 3. These were pallor (88.8%; 95/107), fever (86.0%; 92/107), bleeding per vaginam (72.0%; 77/107),

Table 1: Distribution of the patients based on socioeconomic and marital status

Socioeconomic status	No. of cases (*n*=107)	Percentage
Lower	76	71.0
Middle	29	27.1
Higher	02	1.9
Total	107	100
Marital status		
Married	83	77.6
Unmarried	12	11.2
Separated	9	8.4
Widows	3	2.8
Total	107	100

abdominal pain (64.8%; 69/107), and foul-smelling vaginal discharge (47.7%; 51/107).

Majority of the patients in grade I (60.9% 28/46) required exploration of uterus, whereas most of the patients in grade III (89.5%; 34/38) had exploratory laparotomy. There were 14 maternal deaths, giving a case fatality rate of 13.1%. Of the 14 maternal deaths from septic abortions, 11 (78.6%) had grade III disease, whereas 3 (21.4%) had grade II disease. The immediate causes of death were septic shock (10/14), renal failure (3/14), and disseminated intravascular coagulation (1/14). The complications associated with septic abortion are shown in Table 4. Uterine injury (40.2%; 43/107) and shock (38.3%; 41/107) were the leading complications.

DISCUSSION

The case fatality from septic abortion in the present study was 13.1%. In the studies by Pal *et al*., the maternal mortality rate was 623.46 per 100,000 live births.[8] Pal *et al*., reported[8] 18.17% case fatality rate for septic abortions. Major obstetric complications accounted for more than three-fourths of maternal deaths with the well-known triad of toxemia (50.56%), sepsis (18.17%), and hemorrhage (9.72%).[8] Percentages of maternal mortality due to septic abortion in this study was 15.4%, whereas that from previous studies were as follows: Singh *et al*.,[9] 16.6%, Sinha and Bara[12] 33.33%, and Pal *et al*.,[8] 18.17%.

Table 2: Bacteriological analysis

Specimen cultured	Organisms isolated	No. of cases (*n*=107)	Percentage
High vaginal/Endocervical swab culture	*Escherichia coli*	67	62.6
	Klebsiella pneumonae	35	32.7
Pus/material obtained from laparotomy/culdocentesis	*Staphylococcus aureus*	28	26.2
	B. hemolytic streptococcus	21	19.6
Product of conception	*Pseudomonas aeruginosa*	15	14.0
	Bacteroids	17	15.9
	Anaerobic streptococcus	13	12.1
	No growth	07	6.5

Table 3: Mode of presentation on admission

Presenting features	No. of cases (*n*=107)	Percentage
Pyrexia	92	86.0
Bleeding per vaginam	77	72.0
Foul-smelling vaginal discharge	51	47.7
Abdominal pain	69	64.5
Pallor	95	88.8
Shock (hypovolaemic/endotoxic)	27	25.2
Peritonitis (pelvic/generalized)	21	19.6
Oliguria/anuria	6	5.6
Pelvic mass/abscess	4	3.7

Table 4: Complications associated with septic abortion

Complications	Number (*n*=107)	Percentage
Uterine injury	43	40.2
Shock	41	38.3
Injuries to the gut/omentum	25	23.4
Pelvic abscess	11	10.3
Hepatic failure	2	1.9
Septic thrombophlebitis	2	1.9

More than 60% of maternal deaths were from rural areas in studies by Pal *et al*.[8] Singh *et al*.,[9] found that majority (81.25%) of age group for septic abortion was between 21 and 35 years. According to Singh *et al*., 61.68% cases were from rural areas; 62.5% of septic abortion cases were multiparous and in 70.83% of cases termination was done in first trimester and 95.83% of the termination was done by untrained persons. In the present study, 61.7% were from rural areas and 84.5% abortions were performed by unqualified personnel, 64.5%) had abortions in the first trimester. The most common complication was generalized peritonitis (62.5%). Septic shock was seen in 33.3% of the subjects and 16.6% of them died.

Sinha and Mishra[10] reported that the organisms responsible for septic abortions were mainly *E. coli* (43.75%), β-hemolytic streptococci (18.75%), staphylococci (20.83%), bacteroids (6.25%), and others including gonococci, chlamydia, *Clostridium perfringes*, *Mycoplasma homines*, and *Haemophilus influenzae* (2.08%). Bacteriological examination revealed that *E. coli* (62.6%), *Klebsiella pneumonae* (32.7%), and *Staphylococcus aureus* (26.2%) were the most common organisms isolated in the present study.

Half of the cases required surgical treatment. Peritonitis occurred in 35.51% of cases.[10] Shock was present in 38.31%. Injury to the genital tract was found in 40.18% subjects.[10] As reported by Singh *et al*.,[9] most common complication was generalized peritonitis (62.5%). Other complications were septic shock (33.33%), acute renal failure (14.58%), and coagulation failure (2.08%). In our study, the immediate causes of death were septic shock (10), renal failure (3) and disseminated intravascular coagulation (1). The complications associated with septic abortion were uterine injury (40.2%) followed by shock (38.3%).

Early marriage, high parity, poor socioeconomic condition, lack of availability of safe abortion services, and awareness may all increase the incidence of septic abortions.[12-14] In the present study 77.6% were married and had early marriages, 71.0% were from lower socioeconomic class, 61.7% were from rural areas, and 84.5% abortions were performed by unqualified personnel.

Maternal death review (MDR) is an important strategy to improve the quality of obstetric care and reduce maternal mortality and morbidity. The importance of MDR lies in the fact that it provides detailed information on various factors at facility, district, community, regional, and national level that are needed to be addressed to reduce maternal deaths. Facility-based MDR is a process to investigate and

identify causes, mainly clinical and systemic, which lead to maternal deaths in the health facilities; and to take appropriate corrective measures to prevent such deaths. Community-based MDR is a process in which deceased's family members, relatives, neighbors or other informants, and care providers are interviewed, through verbal autopsy. The key principle to be adopted during the entire process of reviewing is not to blame or find fault with anybody but to take appropriate corrective measures and to sensitize the service providers to improve the accountability.[12-14] We are conducting MDRs to find a proper guideline to reduce maternal death from any cause.

The present study was a sample survey of septic abortion cases coming to a referral hospital. We plan to carry a large multicentric study at the state level, involving peripheral centers to throw more light on septic abortion.

CONCLUSION

The incidence of septic abortion in the present study is relatively high, and majority of the cases resulted from attempted termination of pregnancy. It is a significant contributor to maternal mortality. Promotion of family planning and legalization of abortion services will go a long way in reducing the incidence of septic abortion and its associated complications.

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