Septic Abortion: A 5-Year Experience at Siriraj Hospital

Chenchit Chayachinda MD*, Manopchai Thamkhantho MD*,
Moalee Bhuwapathanapun MD*, Alisara Srinilta**

** Unit of Gynecologic Infectious Diseases and Female Sexually Transmitted Diseases, Department of Obstetrics and Gynecology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand*
*** Medical student, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand*

Objective: *To report characteristics of the patients with septic abortion between 2006 and 2010.*
Material and Method: *The present retrospective study was done by reviewing the medical records of the women who were admitted to Siriraj Hospital between 2006 and 2010 with the diagnosis of septic abortion.*
Results: *Eighty-three women were admitted to Siriraj Hospital and diagnosed with septic abortion. The mean age was 25.1 years (range 14 to 40 years) and the mean gestational age was 11.3 weeks (range 6 to 24 weeks). Fifty percent of them had a history of induced abortion and 65% came with an incomplete abortion. The principal presenting symptom was abnormal uterine bleeding. Insertion of vaginal tablets appeared to be the most commonly used method of induced abortion. Ampicillin* and *gentamicin* plus *metronidazole were the mainstay empirical antibiotics. Length of hospital stay ranged from 2 to 24 days. After the clinical improvement, oral pill was the most popular contraceptive method.*
Conclusion: *Septic abortion remains a big issue in Thai society. To mitigate the problem, sex education, particularly emphases on contraception, should be encouraged.*

Keywords: *Septic abortion, Admission, Hospitalization, Characteristics*

J Med Assoc Thai 2012; 95 (3): 307-12
Full text. e-Journal: *http://www.jmat.mat.or.th*

Abortion or miscarriage is the pregnancy termination before a live birth is possible. It can occur spontaneously or by induction[1]. The duration of pregnancy is also included in the definition, which varies according to countries and available facilities. For example, the National Center for Health Statistics, the Centers for Disease Control and Prevention, and the World Health Organization propose the cut point at the gestational age (GA) of 20 weeks or with a fetus born with the weight less than 500 grams (g). At Siriraj Hospital, abortion is defined as pregnancy termination prior to 24 weeks' gestation or with a fetus weighing less than 650 g.

Infection is one of the serious complications following the process of miscarriage and septic abortion appears to be the most serious form. Septic abortion is an infection of the uterus and its adjacent organs following any kinds of abortion, especially illegally performed induced ones. It is characterized by a rise of temperature to at least 38°C, associated with excessive vaginal discharge and lower abdominal tenderness[2]. Its inflammatory process usually goes beyond myometrium and brings about hospitalization. Both aerobic and anaerobic bacteria, including the normal, vaginal flora, can be the causative organisms[3], sometimes coexisting with any of retained products of conception or operative injury or septic procedures[4].

In countries where induced abortions cannot be performed legally, the term 'unsafe abortion' is used to describe the induced abortion conducted by unskillful providers using hazardous or unsanitary techniques[5]. However, as many countries presently accept legal abortion, unsafe abortion can refer to induced abortion[6]. In 2008, there were approximately 10.8 million unsafe abortions in Asia and those resulted in close to 13% of all maternal deaths[7]. The present study aimed to report the characteristics of patients with septic abortion who were hospitalized in Siriraj Hospital between 2006 and 2010.

Correspondence to:
Chayachinda C, Unit of Gynecologic Infectious Diseases and Female Sexually Transmitted Diseases,Department of Obstetrics and Gynecology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, 10700, Thailand.
Phone: 0-2419-4775, Fax: 0-2419-4997
E-mail: chenchit.c@gmail.com

Material and Method

The present study was approved by the Siriraj Institutional Review Board (SiRB), Faculty of

Medicine Siriraj Hospital, Mahidol University. The present retrospective study was conducted by reviewing the medical records of all patients who were hospitalized and discharged with the diagnosis of abortion associated with infection in Siriraj Hospital between 2006 and 2010.

Definitions[1]

Incomplete abortion means an abortion in which not all of the products of conception are expelled from the uterus.

Inevitable abortion means a condition in which the cervix has become dilated, and abortion will invariably occur.

Statistical analyses

Data were analyzed using SPSS version 18 and presented in number, percentage, and mean with range or mean $\pm$ SD as appropriate. Chi square was used to compare of characteristics between patients with induced abortion and spontaneous abortion. A p-value of < 0.05 was considered statistically significant.

Results

Between 2006 and 2010, 83 hospitalized patients were diagnosed with septic abortion (25 cases in 2006, 10 cases in 2007, 12 cases in 2008, 17 cases in 2009, and 19 cases in 2010). The mean age was 25.1 years (range 14 to 40 years) and the mean gestational age was 11.3 weeks (range 6 to 24 weeks). Thirty-eight patients had undergone any methods of induced abortion. Among them, 18.4% had had a previous illegal abortion.

Table 2 demonstrates methods of induced abortion. Insertion of vaginal tablet was the most commonly used technique (15/38, 39.5%), followed by uterine aspiration (7/38, 18.4%) and fluid instillation into uterine cavity (6/38, 15.8%). The range of lag period from the procedure to admission was 2 to 120 (mean 10.6 days). The longest one (120 days) belonged to a patient whose pregnancy was incompletely terminated four months prior. The repeated curettage was performed, for the provisional diagnosis was incomplete septic abortion.

Ampicillin and gentamicin plus metronidazole were the principal regimen of initial empirical antibiotics. Seventy patients underwent uterine curettage to evacuate the septic content. On average, the antibiotics were started 6.9 (0 to 48) hours prior to the procedure. The pathological reports supported the intrauterine infection for 70.0%, whereas about 15.0% of those had normal chorionic villi and the other 15.0% revealed no villi (Table 1).

Table 1. Characteristics of patients with septic abortion in Siriraj Hospital between 2006 and 2010 (n = 38)

Characteristics	Mean (range) or n (%)
Age	25.1 (14-40)
Gravida	
1	37 (44.6)
≥ 2	46 (55.4)
Parity	
0	43 (51.8)
≥ 1	40 (48.2)
Abortion	
0	69 (83.1)
≥ 1	14 (16.9)
Gestational age (weeks)	11.3 (6-24)
History of induced abortion	38 (45.7)
Lag period from induced abortion to hospitalization (days)	(2-120)*
Type of abortion	
Incomplete abortion	54 (65.1)
Inevitable abortion	29 (34.9)
Presenting symptom(s)	
Abnormal uterine bleeding	68 (81.9)
No abnormal uterine bleeding	15 (19.1)
Initial antibiotics regimen	
Ampicillin, gentamicin, metronidazole	64 (77.1)
Others	19 (22.9)
Underwent curettage after hospitalization	70 (84.3)
Pathological report (n = 70)	
Chorionic villi	10 (14.3)
Inflammation	49 (70.0)
No conceptive product	11 (15.7)
Length of hospital stay (days)	4.6 (2-24)

Data was shown in mean with range or n (%) as appropriate

Table 2. Methods of induced abortion (n = 38)

Methods of induced abortion	n (%)
Insertion of vaginal tablet	15 (39.5)
Uterine aspiration	7 (18.4)
Fluid instillation into uterine cavity	6 (15.8)
Suppository medication followed by evacuation and curettage	4 (10.5)
Unknown oral medication	2 (5.2)
Curettage alone	1 (2.6)
Unknown	3 (7.9)

All of the patients had cervical swab at the initial pelvic examination. The biggest portion (47.0%) of cervical swab culture revealed no growth, followed by mixed organisms, at 38.5%. The positive cultures were Gr. B streptococcus (6.0%), methicillin-sensitive *S. aureus (MSSA)* (4.8%), *N. gonorrhea* (2.4%), and *E. fecalis* (1.2%). All cases had hemoculture for aerobic bacteria and the results were all negative.

The hospital stay ranged from 2 to 24 days. Only one patient was hospitalized for more than 20 days. She was a 27-year-old woman, who underwent an induced abortion by vaginal suppository medication followed by evacuation and curettage at a local clinic. Being diagnosed with septic abortion with bilateral tubo-ovarian abscess, she was given empirical antibiotics. Later, total abdominal hysterectomy, bilateral partial oophorectomy, abdominal toileting, and penrose drain placing had to be performed owing to worsening of clinical signs. Drug-induced fever developed after the operation resulting in commencement of new antibiotics regimen.

Two patients developed septic shock upon arrival. Both of them had had a history of induced abortion using vaginal suppository medication. Vaginal bleeding persisted for almost a week until the severe symptoms developed. They were admitted to the Intensive Care Unit (ICU) for antibiotics and resuscitation. Evacuation and curettage was done to remove the infective source, and the recovery was dramatic.

Table 2 showed the methods of induced abortion of 38 patients. Table 3 shows the comparison of characteristics of patients with induced abortion and spontaneous abortion. The former group appeared significantly younger. Before being discharged, 50% opted for oral pills, 30% refused immediate contraception, and 20% chose long-term methods.

Discussion

The present study demonstrates that the septic abortion deserves attention since its number of cases remained unchanged over years. This may be explained by the fact that septic abortion among teenagers appeared significant[4]. This group of the population may not have enough maturity and responsibility to deal with the consequences of unsafe sex. The present study revealed that about twenty-eight percent of the patients were adolescents (14 to 19 years old) and 55.4% were less than 25 years of age. It was much higher than the report by Grimes DA et al[8] that 30% of unsafe abortions in Asia were in women less than 25 years old. In addition, patients with a history of induced abortion were statistically younger than those with spontaneous abortion. This supported the study by Stotland N[9] that the reasons for induced abortion were youth, the need to finish school, the financial need as well as the lack of social supports and the study by Shahbazi S[10], which indicated that the main reason for hiding abortion is social pressure, not legal penalties.

Insertion of vaginal tablet was the method used by almost 50% of the patients that had the history of induced abortion. Nowadays, medical abortion with the administration of such drugs as mifepristone and misoprostal has gained popularity. A recent report revealed that their anti-progesterone effect and the anti-glucocorticoid effect impair innate immune system[11] and result in the increased incidence of

Table 3. Comparison of characteristics between patients with induced abortion and spontaneous abortion

	Induced abortion (n = 41)	Spontaneous abortion (n = 42)	p-value
Age (year)	23.22 ± 6.06	26.69 ± 8.52	0.036
Gravida	1.98 (1-5)	2.00 (1-6)	0.929
Parity	0.76 (0-4)	0.74 (0-4)	0.935
Abortion	0.22 (0-3)	0.24 (0-3)	0.887
Gestational age (weeks)	11.15 ± 5.15	11.43 ± 6.28	0.823
Length of hospital stay (days)	5.12 ± 3.67	4.12 ± 2.27	0.140
At admission hematocrit (%)	29.60 ± 5.48	30.92 ± 5.21	0.287
Type of abortion			
Incomplete abortion	28 (68.29)	26 (61.90)	0.542
Inevitable abortion	13 (31.71)	16 (38.10)	
Underwent curettage after hospitalization	36 (87.80)	34 (80.95)	0.390

Data shown in n (%), mean ± SD, mean (range) as appropriate

septic shock due to *K. pneumoniae* and *C. Perfringens and C. Sordelli*[12]. However, most of the positive cervical swab cultures in the present study were mixed organisms. Forty-seven percent revealed negative results probably because the culture for anaerobic bacteria was not routinely done during that time and such anaerobic bacteria were easily expired by exposure to oxygen-contained environment.

The present study demonstrated that 15% of the patients were injected with an unknown solution into their uteri in order to terminate pregnancies, contrasting to the report by Srinil S from Khon Kaen Hospital, a referral hospital in the northeastern part of Thailand, that 81.8% of 44 patients with acute renal failure following septic unsafe abortion had undergone similar procedure[13]. Such an unsafe technique was more common in the rural part of the country probably owing to lower accessibility to medical modality and unawareness of the severe consequences.

Vaginal bleeding appeared prominent among these patients, which is comparable with a report of 152 patients in Pakistan[14]. However, only 10.0% of the patients received blood transfusion and only one out of 83 in the present study was hypovolemically shocked. The situation in the Pakistan study appeared much more severe that 23.0% of induced abortion patients presented with shock owing to excessive vaginal bleeding[14].

At present, there is no consensus on the recommended first-line antibiotics regimen for septic abortion. The primal objective of such antibiotics treatment is to cover gram-negative, gram-positive, and anaerobic bacteria. Fawcus SR proposed cefuroxime, metronidazole, and gentamicin as the first combined medications[6] for the concern of the beta-lactamase activity. Yet, ampicillin and gentamicin plus metronidazole had been the initial regimen in the present study when close monitoring for the clinical response during the first 24-48 hours was done. One patient was given meropenem as the first antibiotics because she was severely ill and was admitted to ICU upon arrival.

Atri M reported the reliability of ultrasonography as the tool to detect retained products of conception that its sensitivity, specificity, negative- and positive-predictive, and accuracy values were 81.0%, 71.0%, 85.0%, 64.0%, and 75.0%, respectively[15]. In Siriraj Hospital, either transvaginal or trans-abdominal ultrasonography was performed on all patients to evaluate intra-uterine conditions Among 70 curettage specimen, the pathological reports revealed no conceptive products in 15%. Blood clot and focal uterine contraction might disguise as the intrauterine content.

From literature review, the causative agents included *E. coli*, *Klebsiella* species, *Proteus* species, Group B beta-hemolytic streptococcus, staphylococcal organisms, *Bacteroides* species, *N. gonorrhea*, *C. trachomatis*, *C. perfringens*, *H. influenzae*, *M. hominis* and *Cryptococcus neoformans*[12,16-19]. *Streptococcus agalactiae* or Group B streptococcus was found up to 25.4% of women's vagina[20] and had been reported to cause a severe infection[21]. Nonetheless, the present study found this organism at only 6% of all microbiology results.

One sample demonstrated *Enterococcus faecalis*, a gram-positive bacterium inhabiting the gastrointestinal tract, which has not been reported as an etiologic agent of septic abortion. The patient came with a rupture of membranes at the GA of 23 weeks. She developed a high fever during hospitalization. The infective agent might have contaminated into the uterus through the ruptured site of amniotic membranes. Three cultures revealed *MSSA*, which normally inhabit on the skin. Previous studies stated that *S. aureus* infective endocarditis and septic pulmonary embolism could occur after septic abortion[22,23]. None of such critical events was demonstrated in the present study.

Compared to a review of 264 patients with septic abortions in Nigeria[4], there were lower numbers of admitted cases to ICU (22/264, 8.3% vs. 2/83, 2.4%) and lower maternal mortality (14/264, 3.5% vs. 0/83, 0.0%). The authors of the Nigerian study explained that the causes were unhygienic environments and poorly-equipped private clinics, which are somehow unusual in the current situations of Bangkok. Moreover, an Indian report of 434 admitted patients with septic abortion showed that 54 cases had to undergo various surgical procedures such as repairing of uterine perforation, hysterectomy, gut repair, and other procedures[24], while only one out of 83 patients in the present study underwent hysterectomy. This support the study by Srinil S that sanitary practice and procedural technique play an essential role in the outcomes of induced abortion[25].

To reduce the incidence of unsafe abortion, three steps have been proposed by Fawcus SR, as follows, primary prevention (health education, empowerment of women, and contraception), secondary prevention (enabling abortion legislation, and provision of comprehensive safe abortion care services) and tertiary prevention (proper plan of

treatment for abortion complicated with infection)[6]. For example, perioperative oral doxycycline given up to 12 hours prior to a surgical abortion, which has been proposed by the Society of Family Planning (SFP guideline 20102), can effectively reduce infectious risks[26]. Each medical center should provide the guidelines for critical care of patients with severe infection. At Siriraj Hospital, all patients who undergo termination of pregnancy will receive antibiotics for 7 days. Recently, a multidisciplinary guideline for taking care of severe sepsis/septic shock patients has been launched to improve the standard of care[27].

In conclusion, septic abortion remains a significant problem in Thai society and women's health care. Both spontaneous and induced abortions are related to septic abortion. To mitigate the problem, prevention of unwanted pregnancy, early diagnosis and early treatment of abortion complicated with infection are the key steps. Sex education, particularly emphases on contraception, should be more encouraged.

Acknowledgement

The present study was supported by Siriraj Research Development Fund. The authors wish to thank Associate Professor Vitaya Titapant for providing the annual reports of all admission patients.

Potential conflicts of interest

None.

References

1. Cunningham F, Leveno K, Bloom S, Hauth J, Rouse D, Spong C. Williams obstetrics. 23rd ed. New York: McGraw Hill; 2010: 215-37.
2. Rana A, Pradhan N, Gurung G, Singh M. Induced septic abortion: a major factor in maternal mortality and morbidity. J Obstet Gynaecol Res 2004; 30: 3-8.
3. Ledger JW. Infectious complications associated with legal termination of pregnancy. In: Monif GRG, Baker DA, editors. Infectious diseases in obstetrics and gynecology. 6th ed. Hamshire: IDI Publications; 2008: 349-52.
4. Osazuwa H, Aziken M. Septic abortion: a review of social and demographic characteristics. Arch Gynecol Obstet 2007; 275: 117-9.
5. World Health Organization. The prevention and management of unsafe abortion. Geneva: WHO; 1992.
6. Fawcus SR. Maternal mortality and unsafe abortion. Best Pract Res Clin Obstet Gynaecol 2008; 22: 533-48.
7. World Health Organization. Global and regional estimates of the incidence of unsafe abortion and associated mortality in 2008. Geneva: WHO; 2011.
8. Grimes DA, Benson J, Singh S, Romero M, Ganatra B, Okonofua FE, et al. Unsafe abortion: the preventable pandemic. Lancet 2006; 368: 1908-19.
9. Stotland NL. Psychiatric aspects of induced abortion. J Nerv Ment Dis 2011; 199: 568-70.
10. Shahbazi S. The consequences of unsafe abortion: a qualitative study. J Adv Nurs 2011 Aug 18. doi: 10.1111/j.1365-2648.2011.05826.x.
11. Miech RP. Pathophysiology of mifepristone-induced septic shock due to *Clostridium sordellii*. Ann Pharmacother 2005; 39: 1483-8.
12. Kaponis A, Papatheodorou S, Makrydimas G. Septic shock due to *Klebsiella pneumoniae* after medical abortion with misoprostol-only regimen. Fertil Steril 2010; 94: 1529-5.
13. Srinil S, Panaput T. Acute kidney injury complicating septic unsafe abortion: clinical course and treatment outcomes of 44 cases. J Obstet Gynaecol Res 2011; 37: 1525-31.
14. Fawad A, Naz H, Khan K, Aziz uN. Septic induced abortions. J Ayub Med Coll Abbottabad 2008; 20: 145-8.
15. Atri M, Rao A, Boylan C, Rasty G, Gerber D. Best predictors of grayscale ultrasound combined with color Doppler in the diagnosis of retained products of conception. J Clin Ultrasound 2011; 39: 122-7.
16. Stevenson MM, Radcliffe KW. Preventing pelvic infection after abortion. Int J STD AIDS 1995; 6: 305-12.
17. Stubblefield PG, Grimes DA. Septic abortion. N Engl J Med 1994; 331: 310-4.
18. Cherpes TL, Kusne S, Hillier SL. *Haemophilus influenzae* septic abortion. Infect Dis Obstet Gynecol 2002; 10: 161-4.
19. Mudumbi SV. Disseminated cryptococcosis in an HIV-negative pregnancy: a case of cryptococcal septic abortion complicating an immuno-competent pregnancy. Int J Infect Dis 2010; 14: e351-3.
20. Rocchetti TT, Marconi C, Rall VL, Borges VT, Corrente JE, da Silva MG. Group B streptococci colonization in pregnant women: risk factors and evaluation of the vaginal flora. Arch Gynecol Obstet 2011; 283: 717-21.

21. Deziel PJ, McGuire N, Brown PD. Group B streptococcal meningitis complicating elective abortion: report of 2 cases. Clin Infect Dis 2000; 31: E23-5.
22. Pimentel M, Barbas CS, de Carvalho CR, Takagaki TY, Mansur AJ, Grinberg M, et al. Septic pulmonary embolism and endocarditis caused by *Staphylococcus aureus* in the tricuspid valve after infectious abortion. Report of 2 cases. Arq Bras Cardiol 1989; 52: 337-40.
23. Aslam AF, Aslam AK, Thakur AC, Vasavada BC, Khan IA. *Staphylococcus aureus* infective endocarditis and septic pulmonary embolism after septic abortion. Int J Cardiol 2005; 105: 233-5.
24. Chatterjee C, Joardar GK, Mukherjee G, Chakraborty M. Septic abortions: a descriptive study in a teaching hospital at North Bengal, Darjeeling. Indian J Public Health 2007; 51: 193-4.
25. Srinil S. Factors associated with severe complications in unsafe abortion. J Med Assoc Thai 2011; 94: 408-14.
26. Achilles SL, Reeves MF. Prevention of infection after induced abortion: release date October 2010: SFP guideline 20102. Contraception 2011; 83: 295-309.
27. Chayachinda C, Nuengton C, Chalermchock-charoenkit A, Thamkhantho M. Guideline for taking care of OBGYN patients with severe sepsis/septic shock in Siriraj Hospital. In: Kongsayreepong S, Laohaprasitiporn D, editors. Guideline for taking care of patients with severe sepsis/septic shock in Siriraj Hospital 2011. Bangkok: PA Living; 2011: 29-31.

ภาวะแท้งติดเชื้อ: ประสบการณ์ 5 ปีที่โรงพยาบาลศิริราช

เจนจิต ฉายะจินดา, มานพชัย ธรรมคันโธ, เมาฬี ภูวพัฒนะพันธุ์, อลิสรา ศรีนิลทา

วัตถุประสงค์: *เพื่อรายงานลักษณะของผู้ป่วยที่ได้เข้ารับการรักษาในโรงพยาบาลศิริราช และได้รับการวินิจฉัยเป็นภาวะแท้งติดเชื้อระหว่างปี พ.ศ. 2549-พ.ศ. 2553*

วัสดุและวิธีการ: *เป็นการศึกษาโดยการทบทวนเวชระเบียนผู้ป่วยทั้งหมดที่เข้ารักษาในโรงพยาบาลศิริราช และได้รับการวินิจฉัยเป็นภาวะแท้งติดเชื้อระหว่างปี พ.ศ. 2549-พ.ศ. 2553*

ผลการศึกษา: *ผู้ป่วยที่เข้ารับการรักษาในโรงพยาบาลศิริราชด้วยภาวะแท้งติดเชื้อในช่วงปี พ.ศ. 2549-พ.ศ. 2553 มีจำนวน 83 ราย ผู้ป่วยมีอายุค่อนข้างน้อย (25.1, 14-40 ปี) และมีอายุครรภ์น้อย (11.3, 6-24 สัปดาห์) ประมาณร้อยละ 45 ให้ประวัติการทำแท้ง พบภาวะแท้งค้างร้อยละ 65 อาการหลักที่นำผู้ป่วยมาโรงพยาบาลคือ อาการเลือดออกทางช่องคลอด วิธีที่ใช้ในการทำแท้งที่ใช้กันมากที่สุดคือ การเหน็บยาทางช่องคลอด ยาปฏิชีวนะที่ใช้เบื้องต้นมากที่สุดคือ ampicillin และ gentamicin และ metronidazole ระยะเวลาเข้ารับการรักษาในโรงพยาบาลตั้งแต่ 2-24 วัน ยาเม็ดคุมกำเนิดเป็นวิธีการคุมกำเนิดที่ได้รับความนิยมมากที่สุดหลังการรักษา*

สรุป: *ภาวะแท้งติดเชื้อยังคงเป็นภาวะที่ควรได้รับความสนใจในสังคมไทย การป้องกันการตั้งครรภ์ที่ไม่พึงประสงค์และการรักษาอย่างทันท่วงทีเมื่อมีอาการติดเชื้อหลังการแท้งจะช่วยลดอุบัติการณ์ของภาวะแท้งติดเชื้อได้ ควรมีการให้ความรู้เกี่ยวกับเพศศึกษามากขึ้นโดยเฉพาะอย่างยิ่งในเรื่องการคุมกำเนิด*