Clinical Characteristics in Patients with and without Renal Failure after Illegal Abortion in Maharat Nakhon Ratchasima Hospital

Pisek Tonsawatwong, M.D.*

ABSTRACT

Problem : Renal failure is the serious complication in illegal abortion. There were very few reports on its incidence and none of the reports had studied on the difference of the clinical characteristic, treatment methods, treatment outcomes and the prognosis.

Objective : To study on the incidence, clinical characteristics of acute renal failure after illegal abortion, and the difference in clinical characteristic in patients with and without this complication in Maharat Nakhon Ratchasima Hospital.

Study design : Historical cohort study

Setting : Department of Obstetric and Gynecology and Family planning, Maharat Nakhon Ratchasima Hospital.(MNH)

Material : 247 cases of illegal abortion that had been admitted from 1 January 2000 to 31 December 2004 were included into the study.

Methods : Data were collected from the inpatient medical records, reanalyzed and filled into the Microsoft excel. Statistic analysis was done by using standard program. Statistic methods were Percentage, Chi-square, T-test.

Results : The incidence of illegal abortion was 16.56% of all abortion. Mostly were found in patients between 20-29 and < 20 years of age which were 50.61% and 35.22% respectively. Employees were found 35.77%. Students were found 34.15%. The median gestational age was 13.8 weeks. 88.64% of the abortions were not done by medical doctors. Injection of solutions into uterine cavity was used in 57.89% of cases. Complications that were recorded were septic abortion (221 cases, 94.85%), blood transfusion (55 cases, 22.36%), ICU admission (3 cases, 1.21%), emergency surgical treatment (10 cases, 4.05%), renal failure (32 cases,

Thai Board of OB-GYN*:Department of Obstetrics and Gynecology and Family Planning, Maharat Nakhon Ratchasima Hospital, Nakhon Ratchasima 30000, Thailand

13%), and death (1 case, 0.40%). Positive vaginal swab cultures were found in 23 cases (48.93%) and positive hemocultures were found in 15 cases (24.59%)

Acute renal failure was found in 32(13%) cases. Conservative treatment was implemented in 29 cases (90.63%). Eight cases(25%) needed hemodialysis or peritoneal dialysis. Others had self-resolution. When compared clinical characteristic between cases with ARF and non-ARF, the study found that the mean age, number of parity, referral cases, injection of solutions into intrauterine cavity, the number of days of fever prior to admission, the duration of treatments and the mortality were much more than non-ARF group with significant.

Conclusion : The incidence of illegal abortion in Maharat Nakhon Ratchasima Hospital was 16.5%. Renal failure was found in 13% of cases and most cases were not associated with severe infection. Conservative treatment was implemented in 90.63% of cases and only 25% of acute renal failure needs hemodialysis or peritoneal dialysis. 1 case was dead from sepsis and acute renal failure.

Key words : Criminal abortion, septic abortion, acute renal failure, conservative treatment

Introduction

From the past four decades, the course of disease and managements of illegal abortion had been changed tremendously. There were changes in term of law, method of abortion, types of antibiotic usage, components of blood usage, hemodialysis and the management protocol in intensive care unit. All these led to the changes in the incidence, complications, treatments and mortality rate of illegal abortion.[1, 2, 3]

During 1973-1985, there was a decline in illegally induced abortion in USA. A decline of fivefold from 3.3 to 0.4 death per 100000 procedures was seen; this rate was lowered than the legal-abortion (0.6 deaths per 100000 procedures)[3]. In 1992, 17 deaths were from spontaneous abortion, 10 deaths were from legal abortion, but no death had occurred after illegal abortion[4].

In 2004, WHO[5] had announced on the situation of illegal abortion. They reported that the worldwide incidence of illegal abortion was declining; more were seen in developed countries. However, there were

still voluntarily abortion 46 million per year, 27 million were legal and 19 million were illegal. 66% of illegal abortions occur among women aged between 15-30 years, while 14% were below 20 years. There seemed to be higher incidence in developing countries among the teenage group. Mortality rate of illegal abortion in developing and developed countries were 0.1%, whereas in underdeveloped countries were 0.4% (Asia 0.3% and Africa 0.7%).

Acute renal failure(ARF) is one of the severe complications of illegal abortion which death could be prevented. At present, there is still no report on the incidence of ARF after illegal abortion based on the value of creatinine. Most reports emphasized on the association with severe infection which lowered down the true incidence of renal failure. Only one report had given the definition of ARF as creatinine >2 and reported only in ICU cases, the incidence of ARF after septic abortion to be 73%[6]. Until now, clinical characteristics and the managements of ARF after illegal abortion had not been clearly studied or reported.

The author had the interest to study on the incidence of ARF after illegal abortion in MNH and compared the clinical characteristics between patients with and without ARF, so as to provide a better management for this group of patients.

Materials and Methods

Inpatient medical records of illegal abortion that had been admitted from 1 January 2000 to 31 December 2004 were collected, reanalyzed and filled into the Microsoft excel. Statistic analysis was done by using standard program. Statistic methods were Percentage, Chi-square, T-test, statistically significant (P-value < 0.05).

Definition

Criminal abortion: Abortion that is not done by medical doctors or does not indicate by law.

Septic abortion: Illegal abortion that has fever or purulent or foul smell discharged or present of white blood cell > 10000 cell/ml.

Acute renal failure : Serum creatinine equal or more than 2mg/dl.

Conservative treatment : All treatments for septic abortion that do not require laparotomy.

Sample Size : Sample calculation is based on single group with known average Prevalence of criminal abortion (about 20%)

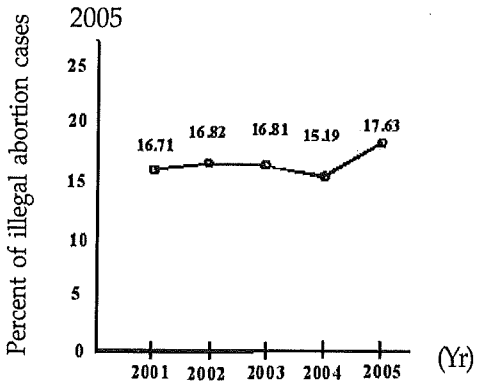
$$n = \frac{(1.96)^2 pq}{d^2} \quad : p = .20,\ q = 80,\ d = 0.05$$

$$n = \frac{(1.96)^2 (.20)(.80)}{(0.05)^2} = 245.76$$

Results

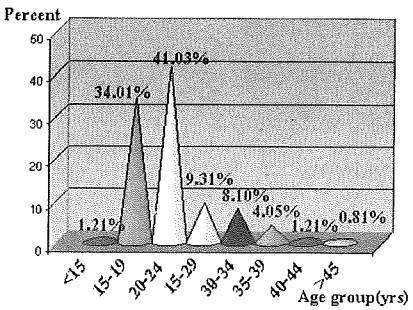
During the study period, 274 patients were diagnosed as illegal abortion; calculated to be 16.56% of the total abortion (1,655 cases). The incidence of illegal abortion during the study period was stabled (Fig. 1). Only 247 medical records (90.15%) could be collected and studied.

Figure 1 Trend of incidences from 2001-2005



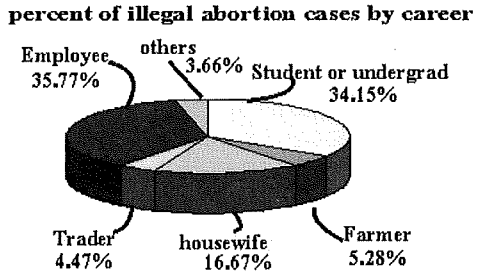
The median age of illegal abortion was 22.19 years (min. 14 years and max. 47 years) Mostly were found during 20-29 years of age (50.61%). Less than 20 years were 35.22%. 3 cases were 14 years and 2 cases were more than 44 years of age (Fig. 2).

Figure 2 Percent of illegal abortion cases by age group



The percentage of illegal abortion that were employee, student, housewife, farmer, trader were 35.77%, 34.15%, 16.67%, 5.28% and 4.47% respectively. No government officers or private employees were found in this study (Fig. 3).

Figure 3



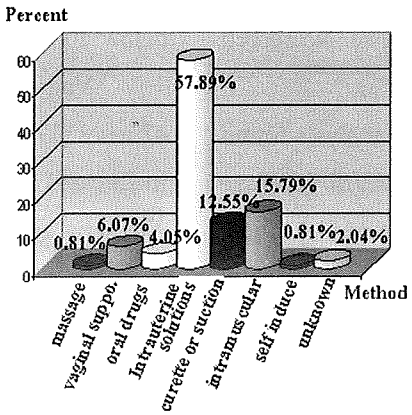
77 cases (31.82%) of illegal abortion were referred from other health-care providers. 68.18% came to MNH by themselves.

72.36% of illegal abortion were nulliparous. One case had the history of 5 gravidarum. 84.62% of illegal abortion were the first-time abortion. Only 2 cases had the history of 2 previous abortions.

The average gestational age of illegal abortion was 13.8 weeks. The minimum gestational age was 4 weeks and the maximum gestational age was 28 weeks.

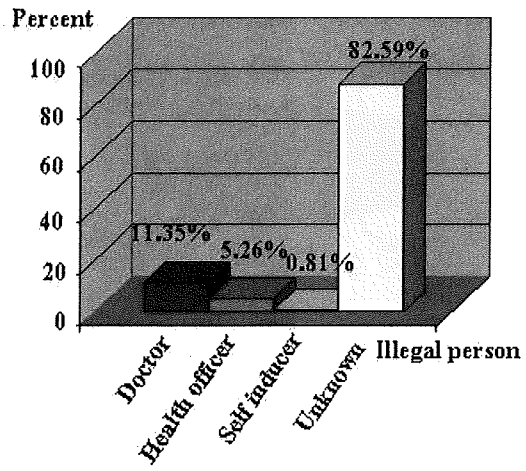
Several methods of illegal abortion were being employed. Injection of solutions into intrauterine cavity accounted for 143 cases (57.89%). Curettage or vacuum aspiration accounted for 31 cases (12.55%). Vaginal insertion of prostaglandins was found in 15 cases (6.07%). Oral ingestion was found in 10 cases (4.05%). Injection of drugs into intramuscular were found in 39 cases (15.79%). Self-assault was done in 2 cases (0.81%) and by others in 2 cases (0.81%) (Fig. 4).

Figure 4 Percent of illegal abortion cases by different methods



Illegal abortion was done by medical doctor, health officer, and self inducer in 11.34%, 5.26%, and 0.81% respectively. The remaining cases (82.59%) were unknown. (fig. 5)

Figure 5



The average duration since the procedure until abortion occurred was 4.76 days. (range 0 to 45 days) The average number of days of fever prior to admission was 0.77 day (max. was 12 days). During the admission, 105 cases (42.5%) had fever. The average number of days of fever during the admission was 2.13 days (range 1 to 12 days).

Foul smell or purulent discharge were present in 50 cases (20.24%). Bloody discharge was found in 162 cases (65.59%). No record was found in 35 cases (14.47%)

Complete blood count analysis found white blood cell > 10,000 cell/dl (average 1,7250 cell/dl) in 206 cases (88.41%). There were 27 cases (11.59%) that had white blood cell < 10,000 cell/dl.

From the definition of septic abortion that was stated above, there were 221 cases (94.85%) that were septic abortion.

The average hematocrit level was 31.03% (min. = 13.4% and max. = 42.9%). Eighty five cases (36.32%) had hematocrit below 30%. Fifty five cases (22.36%) needed blood transfusion with the average of 2.45 units of packed red blood cell (min. =1 unit, max. = 17 units). ten cases (4.29%) had platelet below 100,000/dl.

Vagina swab culture was done in 47 cases (19.03%). Positive culture was found in 23 cases (48.93%). Three cases were E.coli, Neisseria gonorrhea, Klebsiella pneumoniae, bacillus species, Abaumanin, gamma hemolytic streptococcus, Alealigen were found

in 1 case for each bacteria. Mixed positive culture was found in 2 cases. The remaining positive cultures did not identify specific bacteria.

Hemoculture was done in 61 cases (24.7%). Positive culture was found in 15 cases (24.59%). No specific bacteria were identified in 13 cases (21.31%). Abaumanin and Alealigen were found in 1 case for each.

There were 3 cases (1.21%) that had severe sepsis and needed special care in intensive care unit.

Most of the cases were treated with conservative therapy. 10 cases (4.05%) were treated with surgical intervention. (3 cases of TAH with SO, 2 cases of TAH+BSO, 2 cases of laparotomy and drainage, and 1 case for hysterectomy or oophorectomy or salpingectomy)

During the study period, ARF was found in 32 cases (13%). Mean serum creatinine are 8.53mg/dl (range 2.2-22.4mg/dl. Six cases were oliguria and 26 cases were non-oliguria. Hemodialysis was done in 8 cases (25%). The average of hemodialysis was 2.25 times (range1 to 5 times). One case (3.13%) was treated with peritoneal dialysis.

One case was dead from severe sepsis and ARF. Cases with ARF had to admit for an average of 9.09 days (range 1 to 19 days), whereas cases with non-ARF had to admit for an average of 3.16 days. Data were divided into 2 groups; one with and the other without renal failure. Both were compared (Table 1) and found that the average age was higher in ARF group (25.53 years) compared to non-ARF group (21.69 years) with significant. (P=0.001) The incidence of student in ARF group was lower than the non-ARF group. (28.75% vs 35.05%) (NS). The incidence of housewife was also lower in ARF group when compared to non-ARF (12.50% vs 17.25%) (NS).

The mean number of parity in ARF group (0.94 times) was much more in non-ARF group (0.41 times) with significant (P = 0.0016). The average number of previous illegal abortion in ARF group (0.25 times) was more than non-ARF (0.15 times) (NS). The mean gestational age was also higher in ARF group (14.25 weeks) when compared to non-ARF group (13.75 weeks) (NS)

Variables	ARF group Mean or % (SD)	Non-ARF group Mean or % (SD)	P - value
Age (yr)	25.53 (8.58)	21.69 yr (5.63)	P = 0.001
Occupational Student or undergraduate (%) Housewife	 28.12 (7.94) 12.50 (5.84)	 35.05 (3.26) 17.29 (2.58)	 NS NS
Refer (%)	65.62 (8.39)	26.67 (3.05)	P = 0.00
Parity (%)	0.94 (5.57)	0.41 (5.57)	P = 0.0016
Number of Abortion (%)	0.25 (7.78)	0.15 (3.82)	NS
Gestational age (wk)	14.25 (9.40)	13.75 (3.95)	NS
Method use for abortion Intrauterine injection (%)	 90.62 (5.15)	 53.02 (3.40)	 P = 0.0001
Induce by doctor (%)	9.38 (5.15)	11.63 (2.18)	NS
Termination period (day)	4.72 (8.32)	4.77 (4.91)	NS
Fever before admission (day)	1.63 (2.77)	0.65 (1.21)	P = 0.0007
Clinical infection - Fever after admission or - infected discharged or - leukocytosis	93.75	87.56	NS
Blood transfusion (unit)	2.61 (3.66)	2.4 (4.11)	NS
Growth from cervical culture (%)	37.50 (17.11)	51.28 (8.00)	NS
Growth from hemoculture (%)	18.18 (11.62)	26.00 (6.20)	NS
Surgical intervention (%)	9.38 (5.15)	3.26 (1.21)	NS
Mortality (%)	3.12 (3.07)	0 (0)	P = 0.0095
Length of stay in hospital (d)	9.09 (5.09)	3.16 (2.44)	P = 0.0000

The study found that intrauterine injection was more common in ARF (90.62%) when compared to non-ARF (53.02%). (P = 0.0001). Termination by medical doctors, the incidence of ARF (9.38%) was lower than non-ARF group (11.63%) (NS). Termination period was longer in ARF group (4.72 days) than non-ARF group (4.77 days) (NS). The duration of fever prior to admission was longer in ARF group (1.63 days) than non-ARF group (0.65 days) (P = 0.0007). The incidence of septic abortion in ARF group and non-ARF group was 93.75% and 87.56% respectively (NS). The incidence of referred case was also higher in ARF compared to non-ARF group. (65.62% vs 26.67%) (P = 0.000). The average number of days stay in hospital was higher in ARF than non-ARF (9.09 days vs 3.16 days) (P = 0.0000).

Mortality rate in ARF was higher than in non-ARF group (0.40% vs 0%) (P = 0.0095)

Discussion

From the study, the incidence of illegal abortion during the 5-year period was 16.56% of the total abortion, which was similar to the report from Puttachinarat Hospital[7]. (19.82% in the year 2000), lowered than Siriraj Hospital[8] (20.7% during 1968-1978), and Sapasitprasong Hospital[9] (39.13% in the year 1985) but higher than Rampang Hospital[10] (4.85% in 1982). **The incidence of illegal abortion in MNH was roughly the same during the 5-year period study** (16.71%, 16.82%, 16.81%, 15.19% and 17.63% respectively).

The mean age for illegal abortion was 22.19 years (range14-47 years). Mostly were found during 20-29 years old (50.61%). Less than 20 years accounted for 35.22%. This was similar to most reports[7,8,9,10,11], including WHO[5] report in 2004 that stated the worldwide incidence. **This can be concluded that teenage illegal abortion was on an increasing path.**

The percentage of illegal abortion that were employee, student, housewife, farmer, trader were 35.77%, 34.15%, 16.67%, 5.28% and 4.475% respectively. This was similar to many reports[7,8,11]. In this study, there was no government officers and private-sector employees. This may be due to effective contraception use, early termination with medical specialist, or had been treated in the private hospital.

The mean age for illegal abortion was 13.8 weeks (range 4-28 weeks) which was similar to report in 2000 by Pitsanurok Hospital[7] (13.28 weeks). This average gestational age was higher than Siriraj Hospital[8] and Ramathibadi Hospital [11] during 1968-1984 (8-12 weeks). **The reason for higher gestational age may be due to the increase use of safer method of vacuum aspiration during the first trimester. This led to a decrease in complications and admission rate.**

Most common method use is the injection of solutions into intrauterine cavity; 143 cases were found (57.89%). This was similar to many past reports which were about 43.40-87.5%[8,10,12,13]. Curettage or vacuum aspiration was found 12.55% and vaginal insertion of prostaglandins was found 6.07%. **Body assault and oral ingestion of drugs were found less common than the past**[7,8,10].

Illegal abortion was done by medical doctor, health officer, and self inducer in 11.34%, 5.26%, and 0.81% respectively. The remaining cases (82.59%) were unknown.

With the use of septic abortion definition that had been stated above, there would be 221 cases (94.85%) of septicabortion. **This incidence was higher than other reports (22.4-85%)**[7,11] **This wasbecause other reports did not have the strict criteria for its definition, which was done in this study.**

Blood transfusion was given in 55 cases (22.36%), which was closed to the report in Kriplanin Hospital (India;1995)[12]

Vaginal swab culture was performed in 47 cases (19.03%). Positive culture was found in 23 cases (48.93%) which were higher than the report in Bombay Hospital (30.19%). Most common bacteria found were E.coli. This was different from the past report in 1971[13], which Clostridium tetani was the most common bacteria.

Hemoculture was done in 61 cases (24.7%). Culture was positive in 15 cases (24.59%). This incidence was similar to the report from Mayo Clinic and Foundation (24%)[6]. Abaumanin and Alealigen were identified and each was found in 1 case, which was not statistically significant.

3 cases (1.21%) were admitted into ICU due to severe sepsis.

10 cases (4.05%) were treated with exploratory laparotomy, which was slightly higher than the report from Siriraj Hospital (2%)[8]. This could be concluded that most of illegal abortion could be treated with conservative treatment; however one report did state that the incidence of laparotomy was 16.30%. This may depend on the method of illegal abortion and the quality of the treatments in that region.

In this study, 32 cases (13%) of ARF were found. The mean creatinine was 8.53 mg/dl (2.2-22.4). Six cases were oliguria and 26 cases were non-oliguria. Three cases were associated with pelvic infection and needed laparotomy. **There was one death due to association with severe sepsis, even though surgery and hemolysis were performed. 29 cases of ARF were treated conservatively and only 8 cases (25%) needed dialysis (hemodialysis 7, peritoneal dialysis 1) The remaining case had self-recovery.**

Unlike the others, this study found that **most cases of ARF were not associated with severe infection**[13,14,15,16,17] **and conservative treatment would usually give good outcomes.** Only those with severe pelvic infection and not response to conservative treatment would have the benefit from surgery[18].

There was only one death case (0.4%) from sepsis and ARF with creatinine 12.0 mg/dl. The **high creatinine level did not always implies bad prognosis** because there were 6 survival cases that had higher creatinine. One report found a survivor with total creatinine recovery after 1 year, even though the creatinine level was 15 mg/dl and prolonged anuria (35 days)[19]. A survivor from renal failure with septicemia and consumptive coagulopathy were also reported[20].

When compared both ARF and non-ARF group, the significant variables were: the average age (25.53 years vs 21.69 years, P = 0.001), the number of parity (0.94 times vs 0.41 times, P = 0.0016), intrauterine injection (90.62% vs. 53.02%, P=0.0001), the number of days prior to admission (1.63 days vs 0.65 days, P = 0.0007), referral cases (65.62% vs. 26.67%, P = 0.000), the length of stays in hospital (9.09 days vs 3.16 days, P = 0.0000), and the mortality rate (0.40% vs 0%, P = 0.0095).

Conclusion

The incidence of illegal abortion in MNH was 16.56%. Mostly were found during 20-29 years of age (50.61%). Less than 20 years were 35.22%. Employeesaccounted 35.77% of cases. Studentsaccounted 34.15% of cases. The average gestational age for illegal abortion was 13.8 weeks. Most of the illegal abortion was not done by medical doctors (88.64%) and mostly were done by injection solutions into intrauterine cavity (57.89%). Complications were septic abortion (94.85%), emergency laparotomy (4.05%), and ARF (13%). Most of the ARF did not associate with severe infection. 90.63% of the cases did not need laparotomy and only 25% of cases did go for hemodialysis or peritoneal dialysis. There was one death (0.40%) from severe infection with ARF.

Acknowledgements

● นพ.สัญญา ปราบริปูตลุง หัวหน้ากลุ่มงานสูติ-นรีเวชกรรม ที่อนุมัติให้เก็บข้อมูลทำวิจัย

● คุณกัญญาลักษณ์ ณรังษี คณะกรรมการศูนย์วิจัยและพัฒนาระบบบริการ โรงพยาบาลมหาราชนครราชสีมา ที่ช่วยในการวางแผนเก็บและประเมินข้อมูล

● นพ.วีรพล เขมะรังสรรค์ แพทย์ใช้ทุนกลุ่มงานสูติ-นรีเวชกรรม ช่วยแปลจากภาษาไทยเป็นภาษาอังกฤษ

References

1. Cates W Jr, Rochat RW, Grimes DA, Tyler CW Jr.Legalized abortion:Effect on national trends of maternal and abortion-related mortality. Am J Obstet Gynecol 1987;132: 211-4.
2. Hakim-Elahi E, Tovell HMM, Burnhill MS.O bstet Gynecol 1990;76:129-35.
3. Council on Scientific Affairs, American Medical Association. Induced termination of pregnancy before and after Roe v Wade: trends in the mortality and morbidity of women. JAMA1992;268 :3231-9.

4. Stubblefield PG.Family planning.In: Berk JS, editors. Novak's Gynecology. 13rd ed. Baltimore : Lippincott Williams & Wilkins; 2002. p. 266-8.
5. World Health Organization(who) .Unsafe Abortion: Global and regional estimates of the incidence of unsafe abortion and associated mortality in 2000.4th ed. Geneva, Switzerland 2004.
6. Finkielman JD, De Feo FD, Heller PG, Afessa B. The clinical course of patients with septic abortion admitted to an intensive care unit. Intensive Care Med. 2004 ; 30(6):1097-102. Epub 2004(3).
7. กิ่งมณี กองเงิน, นนท์ โสวัณณะ, ปนัดดา ช่วยแก้ว, อิศราภรณ์ พลหล้า. การศึกษาแนวโน้มของการทำแท้งในระยะเวลา 4 ปี (2539-2542) ปัจจัยชักนำและทัศนคติต่อการทำแท้งของสตรีที่เข้ารับการรักษาในโรงพยาบาลพุทธชินราช พิษณุโลก. (Medline)
8. อมร เกิดสว่าง, สุพร เกิดสว่าง, สุวนีย์ ศรีสุพรรณดิษฐ์ และคณะ ใน : สุพร เกิดสว่าง บรรณาธิการ. พิมพ์ครั้งที่ 1. กรุงเทพฯ: ธีระการพิมพ์; 2523:107-19.
9. Rerk-ngarm S, Gritiyachote S, Jariyaphan M. Analysis of Illegal abortion. 1985 Sep;10(9):629-641.
10. พิมพาพร ตันประเสริฐ. การทำแท้งผิดกฎหมาย. สารศิริราช2525; 34(4) :212-8
11. Pongthai S, Phuapradit W. Illegally in duced abortion. J med Ass Thailand. 1984 Oct;67(S2): 50-2.
12. Sood M, Juneja Y, Goyal U. Maternal mortality and morbidity associated with clandestine abortions.J Indian Med Assoc.1995 Feb;93(2):77-9. (Medline)
13. Baxi LV, Nerurkar AS, Dsourza M, Purandare VN. Septic abortion. J Obstet Gynecol India. 1971 Dec;21(6): 655-60.(Medline)
14. Rana A, Pradhan N, Gurung G, Singh M. Induced septic abortion: A major factor in maternal mortality and morbidity. J Obstet Gy necol Res. 2004 Feb;30(1) :3-8.
15. Utian WH. The cause if death following abortion: An analysis of consecutive cases at Groote Schuur Hospital. J Obstet Gynecol Br Commonw. 1968 Jul;75(7):705-12.
16. Hawkins DF, Sevitt LH, Fairbrother PF, Tothill AU. Management of septic chemical abortion with renal failure. N Engl J Med. 1975 Apr3;292(14): 722-5.
17. Isaac V, Hemlatha H. Abortion and renal failure. J Obstet Gynecol India.1976 Oct; 26(5):656-61.(Medline)
18. Bartlett RH, Yahia C. Management of septic chemical abortion with renal failure. N Engl J Med. 1969 Oct 2;281(14):747-53.
19. Emmanuel DS, Lindheimer MD. Recovery after prolonged anuria following septic abortion. Obstetrics and Gynecology. 1976 Jan ; 47(1):36s-39s.
20. Clarkson AR, Sage RE, Lawrence JR. Consumption coagulopathy and acute renal failure due to gram-negative septicemia after abortion. Ann Internal Med. 1969 June;70(6)1191-9.