

Septic abortions

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SEPTIC ABORTION is a serious complication in early pregnancy and carries a high morbidity and mortality. It is difficult to find out the exact incidence of septic/criminal abortion in a population for the patients would not admit to a criminal abortion. Further, even if there were clinical signs of interference they would strongly deny it.

The only data available are those studies done on hospital admissions. In 1961/1962 Hooi, in a study of 1,000 cases of abortions at the General Hospital, Kuala Lumpur, had 239 cases of septic abortions, giving an incidence of 23.9 per cent.

The above study was carried out at the General Hospital, Kuala Lumpur, with a twofold aim:

- (a) To study the clinical pattern of the disease
- (b) To see if the introduction of the National Family Programme had any impact on the incidence of septic abortions.

Method and Material

This retrospective study was carried out at the Department of Obstetrics and Gynaecology, General Hospital, Kuala Lumpur. The cases under study were 1,000 abortion cases picked at random over the period 1968 to 1969. From these 1,000 cases, all the septic abortion cases were taken out for the study.

Diagnostic Criteria for Septic/Criminal Abortion

The following criteria were used:-

1. A confession or admission of criminal interference of the pregnancy.
2. Circumstantial evidence derived by clinical examination:-
 - (a) Evidence of interference – trauma to vagina or cervix, foreign body in the vagina or in the cervical canal.
 - (b) Evidence of complication, pelvic or abdominal peritonitis, septicaemia, perforation of the gravid uterus, and tetanus.
 - (c) A temperature above 100.4° F. In the absence of temperature any evidence of intra or extra uterine sepsis as evidence of foul discharge through the cervical os.

Data:

The data obtained were tabulated as follows:

Table I
Incidence of septic abortion

Diagnosis	No. of cases	Incidence
Threatened abortion	210	21.0%
Incomplete/complete abortion	735	73.5%
Septic abortion	36	3.6%
Missed abortion	16	1.6%
Habitual abortion	3	0.3%
	1,000	100%

Table I shows that the incidence of septic abortion in 1968/1969 was 3.6%, a dramatic fall from 23.9% in 1961/1962 (Hooi 1963)

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Table II Ethnic Group/Age of septic abortion

Ethnic Group	Age						Total
	15-19	20-24	25-29	30-34	35-39	40	
Malay	1	4	2	1	3	0	11
Chinese	1	3	6	0	1	1	12
Indian	1	2	3	5	0	2	13
	3	9	11	6	4	3	36

Table II shows that the majority of patients were in the age group 25-29. This was true for the Chinese but for the Malays, it was the age group 20-24 and for the Indians the age group 30-34.

Table III Ethnic Group/Parity of septic abortion

Ethnic Group	Parity		
	Primigravida	2-5	6+
Malay	1	7	3
Chinese	1	8	3
Indian	4	0	9
	6	15	16

Table III shows that for the Malays and the Chinese, the majority were in parity 2-5 group, but for the Indians, the majority were in the parity 6 group.

Table IV Ethnic Group/Gestation period

Gestation Period	Ethnic Group			
	Malay	Chinese	Indian	Total
4-8 weeks	4	4	3	11
9-11 weeks	2	3	5	10
12-13 weeks	3	4	1	8
14-16 weeks	1	0	4	5
16+ weeks	1	1	0	2

Table IV shows that the majority of cases were in the 4-8 weeks gestation period.

Table V Clinical features – Ethnic Group

Symptoms	Ethnic Group			
	Malay	Chinese	Indian	Total
Signs				
1. History or evidence of interference on vaginal exam.	5	7	3	15
2. Fever:				
(a) 99°F to 100.3°F	4	4	3	11
(b) Above 100.4°F	5	5	7	17
3. Offensive vaginal discharge	7	2	6	15
4. Abdominal pain	4	2	6	12
5. Pelvic peritonitis	1	1	0	2

Table V shows the clinical features. The majority of patients had multiple clinical features, fever and offensive vaginal discharge being the important signs.

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Table VI — Choice of Antibiotics

Antibiotics	No. of cases
Crystalline Penicillin/Streptomycin	21
Tetracycline	10
Penbritin	2
Chloromycetin	2

Table VI shows that 21 patients (58.5%) received only a combination of crystalline penicillin and streptomycin, which was the drug of choice. If the patient was sensitive to penicillin, then she was given a course of tetracycline, 10 patients (27.7%).

Discussion —

Recent trends in the management of septic abortion.

I. The choice of antibiotics

Since the advent of antibiotics in the last two decades, the course of septic abortions has been markedly altered.

In the series of 336 cases managed by the Septic Abortion Unit of K.K. Hospital since March 1966 as reported by Chong (1969), ampicillin, cephaloridine and chloramphenicol were found to be very useful antibiotics with a high degree of efficacy.

Ampicillin dosage was 500 mg. 6-hourly for 4-5 days, given I.V. in the first 24 hours, then orally when the patient's condition had improved.

Cephaloridine dosage was 500 mg. 12-hourly for 5 days given I.M.

Chloramphenicol dosage was 500 mg. 6-hourly I.V. for the first 24 hours, then orally for another 3-4 days. Toxic effect was not seen in any of the patients using chloramphenicol and it appeared that a short term use of the drug is quite safe and justifiable in the management of ill patients.

Percentage sensitivity of organisms to antibiotics

Drugs	% of organisms sensitive
Ampicillin	71.2%
Chloramphenicol	73.1%
Cephaloridine	55.6%
Streptomycin	65.5%
Penicillin	33.6%

Jones W.R. (1967) reports in the Med. J. of Australia:

Antibiotics	% of organism sensitive
Streptomycin	100%
Chloromycetin	100%
Ampicillin	61%
Tetracycline	52%

The use of penicillin with streptomycin has been quite widely practiced while penicillin alone in massive doses has been employed with good results.

II. Treatment of shock

This could be endotoxic or haemorrhagic.

Endotoxic shock is a state of peripheral vascular collapse induced by a lipoprotein-carbohydrate complex contained in the O-somatic antigen present in the cell wall of the gram negative bacteria. Shock due to *Cl. welchii* or staphylococcal infection is probably caused by exotoxin.

Test for Endotoxin

Douglas and Beckman (1966) from the New York University School of Medicine describe a test for the demonstration of endotoxin in the circulation. Intravenous injection of 7-10 ml. of plasma from the patient is injected into rabbits with simultaneous intracutaneous injection of 100 pgm of adrenaline in the abdomen. A reaction of haemorrhagic necrosis within 8-24 hours indicates the presence of endotoxin in the patient's plasma. This test will be a great help in distinguishing endotoxic shock from hypovolemic shock.

In the analysis of causes of death following abortion in 28 cases by Utian (1968), a striking feature was the development of Ac. Pulm edema after starting transfusion in 5 cases after minimal I.V. fluid administration. This was also noticed in other studies (Ohio State Med. Ass. Committee 1961, Schwarz & Emich 1965). Furthermore C.C.F. was seen in 12 deaths.

It is probable that in some ill septic abortion patients, there exists a precarious cardiodynamic balance with susceptibility to fluid overload. Exaggerating or aggravating factors are renal damage with fluid retention, severe peripheral vasoconstriction, generalised myocarditis, bronchopneumonia and septicaemia. These patients present in a state of hypotension which is mistakenly thought to be due to hypovolemic shock. I.V. fluid therapy then exaggerates the imbalance and results in C.C.F., Pulm. edema and death if the cardiogenic component is not recognised. The necessity for the monitoring of fluid replacement by central venous pressure (CVP) manometry in these severely ill patients is therefore obvious.

Role of nor-adrenaline and metaraminol in endotoxic shock

Nor-adrenaline and metaraminol have often given satisfactory results in septic shock especially when

used in combination with steroids. These agents raise the B.P. by increasing the cardiac output, a beta adrenergic effect which is useful in an endotoxin depressed myocardium. Unfortunately, it is their alpha adrenergic properties which, although producing a temporary rise in B.P. through increased vasoconstriction, ultimately causes further deterioration. So endotoxin induced vasoconstriction is potentiated rather than opposed, leading to diminished tissue perfusion, increasing anoxia, acidosis and eventually organ failure.

So the combined use of vasodilators and adrenergic blocking agents were proposed. Drugs with primarily vasodilative effect, eg. chlorpromazine, phenoxybenzamine, increase tissue perfusion by blocking vasoconstriction but lower the B.P. Therefore in order to maintain B.P. with vasodilators, one must give significant amounts of fluid, a procedure with risk in the face of myocardial depression. These drugs have been given in conjunction with metaraminol and nor-adrenaline with beneficial effects but their combined use is complicated.

Cavanagh & McLeod used metaraminol (Aramine) on 35 patients between July 1959 and July 1965.

His classification of shock state is as follows:-

Severe	Systolic B.P. less than 50 mm. Hg.
Moderate	" 50-80 mm. Hg.
Mild	Only transient hypotension was present and was excluded from the study.

Of the 35 patients in the series, 24 were in moderate shock, mean B.P. 68/36; 11 were in severe shock mean B.P. 22/12.

Metaraminol was given in 5% Dextrose I.V. The duration of administration varied from less than 1 hour to 96 hours. Metaraminol elevates both systolic and diastolic B.P. and increases the blood flow through cerebral, renal and coronary vessels. Corticosteroids, used concomitantly with vasopressor agents, appeared to permit the maintenance of the patient on smaller doses of vasoconstrictor drugs. In the series, 23 of the 35 patients survived with metaraminol.

In moderate shock, 21 of 24 survived. In severe shock, 3 of 11 survived. (The reason for such results will be obvious subsequently).

Du Toit et al. (1966) believe that the common denominator in the fatal outcome of endotoxic shock in man is inadequate tissue perfusion as seen in cardiac failure, hypovolemic shock or endotoxic shock and septicaemia. Their criteria for endotoxic shock is when transfusion sharply raised the J.V.P. without

clinical improvement of the shock state. They did not use measurement of peripheral resistance, determination of the oxygen debt or the clinically warm or cold hypotensive state as their criteria.

The following is a brief report on the treatment of endotoxic shock with Isoprenaline by du Toit et al (1966).

Method

Arterial blood is taken for determination of acid-base balance and serum electrolytes which are quickly corrected. Continuous monitoring of urinary output and ECG. and administration of oxygen is done. Massive doses of I.V. antibiotics are given and patient digitalised.

If the JVP as measured by a manometer is below 12 cm. of water, Ringers lactate soln. and/or blood is given. All the patients, initially or after transfusion, had a JVP. of over 12 cm. of water with no improvement or very little, in their clinical condition. At this stage, a 1:450,000 isoprenaline infusion is begun with a dose rate of 0.5-4 ppm/min. A decrease in JVP below 12 cm. of water is matched with a further infusion of appropriate soln. until urinary excretion starts and/or systolic B.P. of 80-100 mm. Hg. is maintained. In their study, isoprenaline drip was no longer required beyond 36 hours.

In man, isoprenaline is a beta adrenergic receptor stimulator producing a 64% increase in cardiac output and dilatation of the capillary network, resulting in 48% decrease in peripheral resistance, i.e., isoprenaline improves tissue perfusion. Renal artery dilatation will improve glomerular circulation and therapy promote urinary excretion at a low arterial B.P.

The possible effects of endotoxin are varied:-

- 1) Intense constriction of arterioles and capillary sphincters in kidneys, liver and intestines.
- 2) Impaired cardiac function with myocarditis and reduced cardiac output.
- 3) Increased pulm. vascular pressure and vascular distension with pulm. edema.
- 4) Intravascular coagulation as a part of generalised Schwaizman reaction with reduced venous return.

Role of steroids in endotoxin shock

The beneficial effects of hydrocortisone is:-

- 1) It alleviates the degree of adrenocortical insufficiency, supporting the patient in the present stress.
- 2) Hydrocortisone blocks the intense regional sympathomimetic action of endotoxins.

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- 3) Hydrocortisone acts directly on peripheral vascular bed restoring vascular tone; it has an inotropic effect on the heart, and
- 4) Hydrocortisone decreases clinical toxicity and permits survival long enough to allow benefit from antibiotics.

Hydrocortisones are given in massive doses, i.e., 0.5 – 1 gm. I.V. at first sign of hypotension and 100 mg. every hour or 0.5 gm. 6-hourly.

III. Surgical management in septic abortion

Whenever there is a nidus of infection, as in the uterine cavity, controversy exists as to the evacuation of the non-viable contents of the uterus.

Evacuation of the uterus immediately or very early has been advocated by Stallworthy (1947), Perera (1961), Schwartz & Emich (1965). Douglas & Beckman (1966) believe that the body defence mechanisms weaken in the face of continuing influx of bacteria or toxins. In fact, extension of infection with clinical deterioration, oliguria, evidence of infection by *Cl. welchii* and endotoxin shocks are reported as indications for early evacuation or hysterectomy.

Goodno et al (1963) and Moritz and Thompson (1966) argue that surgical treatment is a dangerous procedure on these ill patients and should be delayed till general, supportive and antibiotic therapy have improved their condition. They have produced excellent results by delaying the evacuation of the uterus till the patients were afebrile. Neuwirth & Friedman (1963) showed that early evacuation in febrile patients increased the incidence of post-operative pyrexia and hypotension.

In the series of 233 cases of K.K. Hosp., as reported by Sidhu (1969), total duration of pyrexia was very significantly less in the immediately evacuated group than the delayed one. Immediate evacuation means the uterus was evacuated within 24 hours of admission and antibiotic institution. Delayed evacuation means the uterus was evacuated when the patient was afebrile; however, if the patient remained febrile at the end of 72 hours, the uterus was evacuated without delay.

Post-operative pyrexia was more frequent in the immediate group, but that lasted for only 24 hours in 70% of the cases developing pyrexia after evacuation. Though only 24.5% developed post-operative pyrexia in the delayed group, 60% of these (24.5%) had pyrexia lasting more than 24 hours after evacuation. In the immediate group, other complications were negligible, whereas in the delayed group, there was further spread of infection even after the evacuation in the

form of pyrexia, thickened appendages, tubo-ovarian masses and pelvic abscess.

Another group of very ill patients with complications had individual treatment like laparotomy, colpotomy or immediate evacuation if bleeding was excessive.

Utian (1968) advocates immediate digital evacuation of uterus without anaesthesia if the general condition is poor.

The role of Hysterectomy as reported by Douglas & Beckman (1966).

In their series of 50 cases of septic abortion, there were 19 hysterectomies (ie. 38%) of which 13 were primary. In nearly every instance of hysterectomy, there were multiple circumstances and indications which influenced the decision.

Major indication for hysterectomy.

	No.	Died
Unresponsive septic hypotension, large uterus	11	3
Intrauterine douche with necrosis	5	0
Anuria	3	1
Total:	19	4

Anuria was the indication in 3 cases. In their experience, the management of acute renal failure is enormously complicated by the presence of infection, and necrotic tissue mass in the pelvis. Further, the procedure becomes far more dangerous if done at a later time, in the face of mounting uraemia and the need for anticoagulants in relation to hemodialysis.

In all cases, the major indication for hysterectomy was septic hypotension complicating abortion in a large uterus. Six of these patients had had preliminary curettage without beneficial effect. Here, the major consideration was that effective removal of infected tissue could not be accomplished if the uterus was larger than the size of 12-week gestation. Two of these patients pursued a downhill course in septic shock and a third died of pulmonary complications related to severe asthma :-

Response to curettage	No.	Died
Gradual improvement and recovery	22	0
Progression to irreversible shock after curettage.	2	2
In shock when curetted	1	1
No response to curettage hysterectomy	6	2

So if the shock state still persists after conservative therapy of antibiotics and curettage, total abdomi-

nal hysterectomy with BSO is carried out immediately. Early total hysterectomy is advocated in cases of toxic acute renal failure, uterine necrosis, pelvic vascular thrombosis secondary to chemical douche or hepatic involvement (jaundice) as a procedure of choice.

IV. Other methods of management:

- (1) Hypothermia: It has been used with some benefit.
- (2) Hyperbaric oxygen therapy should be of considerable benefit in *Cl. welchii* infection.
- (3) Cardiac glycosides may be of some value in myocardial depression and are indicated if Pulm. edema supervenes. Their prophylactic use is not necessary or desirable because of uncertainty of their performance when circulation is labile.
- (4) Heparinization has been advised to protect against the Schwartzman reaction. Reports suggest that endotoxin induced consumption of clotting factors may result in hemorrhagic tendency and disseminated fibrin deposition. Douglas & Beckman expressed, on the other hand, the

feeling that coagulation defects are rare. They are hesitant to use anticoagulants to their regimen for patients who may require major surgical therapy during their hospital stay.

It is interesting to note that in spite of the fact that the majority of Government hospitals in West Malaysia showed a 100% increase in hospital admission for all types of cases from 1961 to 1970, the incidence of septic abortions showed a fall in incidence.

The reasons for this lowered incidence may be the following:-

- (a) Since 1961, more private hospitals, nursing homes and clinics have been established, with the result that patients wanting termination of pregnancy are depending less on the services of unqualified abortionists.
- (b) With the establishment of the National Family Planning Board services, women are planning their families with the result that there was a fall in the incidence of unwanted pregnancy.

The problem of Septic/Criminal abortions.

Septic/criminal abortions remain a major problem in East Malaysia.

Table VII Septic abortion, admission and deaths in West Malaysia.

	Admission of septic abortion in Govt. Hosp. 1961		Deaths due to septic abortion in Govt. Hosp. 1970	
Perlis	35	11	0	2
Kedah	44	75	2	1
Penang	44	94	0	2
Perak	97	245	7	1
Selangor	173	157	4	1
Negeri Sembilan	64	96	2	0
Malacca	48	24	0	2
Johore	349	63	1	1
Pahang	2	16	0	0
Trengganu	15	22	1	0
Kelantan	11	11	0	0
	882	814	17	10

Table VII shows that in 1961, there were 882 hospital admissions and 17 deaths for septic abortions but ten years later, in 1970, there was a fall to 814 hospital admissions and ten deaths for septic abortion. The States of Perlis, Selangor and Johore showed dramatic reduction in the incidence of hospital admissions for septic abortions.

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Since septic/criminal abortion is a serious problem with high morbidity and mortality, the answer to this problem lies in the prevention of unwanted pregnancies by educating the women and wider utilisation of the family planning services.

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