

# PYOGENIC MENINGITIS AND PREGNANCY

by

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The association of purulent meningitis with pregnancy or puerperium has received practically no mention in obstetric literature, including all the standard text-books and even the monographs devoted to the medical complications of pregnancy (Barnes 1965; Rovinsky and Guttmacher 1965).

At the L.T.M.G. Hospital, 10 patients were observed in whom purulent meningitis occurred either during pregnancy or the puerperium over the period 1961-68. During the same period there were 17 instances of pyogenic meningitis in women of childbearing age who were neither pregnant nor puerperal. A brief account of the clinical course of the disease in these 27 patients is set forth in this paper.

## Material and Methods

We scrutinised the case records of all females between the ages of 15 and 45 who had been diagnosed as

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pyogenic meningitis over an 8 year period (1961-1968). Only those cases were selected in whom the diagnosis of purulent meningitis was substantiated by cerebrospinal fluid examination or by autopsy. Some of these patients had been admitted to the obstetric ward of the hospital, while the others had been in the medical ward.

In addition to routine clinical examination, cerebrospinal fluid examination was performed in all but 3 patients (2 pregnant, 1 non-pregnant) who died before lumbar puncture could be performed. Autopsy data were available in 4 instances, including the latter 3 patients.

## Results

The age incidence of our patients is shown in Table I, while most of the pregnant and puerperal women were between 21 and 30 years of age, the other women were all either above or below this age group.

All the 10 women who were pregnant or puerperal died, while 7 of the 17 non-pregnant ones survived (Table I).

The interval between onset of symptoms and admission is shown in Table II. Fourteen patients were admitted within 3 days of the onset of their illness; 7 of them were preg-

TABLE I  
*Age Distribution and Mortality*

Age in years.	Pregnant and Puerperal		Non-Pregnant	
	Total	Fatal	Total	Fatal
15—20	0	0	10	5
21—25	4	4	0	0
26—30	4	4	0	0
31—35	2	2	4	2
36—40	0	0	2	2
41—45	0	0	1	1
Total	10	10	17	10

TABLE II  
*Time Interval between Onset of Symptoms and Admission to Hospital*

Time	Pregnant & Puerperal		Non-Pregnant	
	Total	Fatal	Total	Fatal
Less than 3 days	7	7	7	1
3 to 7 days	1	1	—	—
1 to 2 weeks	1	1	2	1
2 to 3 weeks	1	1	3	3
Over 3 weeks	—	—	3	3
Total	10	10	15*	8

\* One patient developed meningitis while already in the ward for some other reason, duration of illness in another patient was not known.

nant or puerperal, the other 7 were non-pregnant. All 7 in the former group, but only 1 in the latter group, died.

The interval between admission to hospital and death in the 20 fatal cases is depicted in Table III.

Table IV depicts the C.S.F. values as well as blood haemoglobin values. The pregnant and puerperal group were on an average more anaemic than the other group.

Smear and culture of the C.S.F. were performed in most of the cases,

TABLE III  
*Time Interval between Admission and Death in Fatal Cases*

Time	Pregnant & Puerperal	Non-Pregnant
Less than 24 hours	3	3
1 to 3 days	2	2
4 to 7 days	3	2
1 to 2 weeks	2	1
Over 2 weeks	—	2

The presenting symptoms on admission, in decreasing order of frequency, were fever, vomiting, headache, unconsciousness and convulsions.

but yielded negative results in all, except for one patient in whom pneumococci were identified as the causative organisms. Unfortunately, satisfactory and adequate bacteriological

TABLE IV  
Showing C.S.F. and Blood Haemoglobin Values

	Cerebrospinal Fluid.						Protein mg.			Haemoglobin		
	Cell Count per cu. mm.		Sugar mg. %		Min.		Aver.	Max.	Min.	Aver.	Max.	Min.
	Aver.	Max.	Aver.	Max.	Aver.	Max.	Aver.	Max.	Aver.	Max.	Min.	
Non-pregnant	1697	7500	14	35	0	0	305	600	60	10.13	13.0	8.2
Pregnant and Puerperal	1599	3680	20	75	0	0	471	600	300	8.12	11.0	6.0

data were not available with regard to the series as a whole, and is therefore excluded from this paper.

Table V summarises the total outcome of the illness in the 10 pregnant or puerperal women, and demonstrates the time-relationship of the onset of symptoms and of death to the period of gestation (in pregnant cases) or to the postnatal period (in puerperal cases). The fulminant nature of meningitis is apparent from the short duration of the illness in most of these patients. One patient, who had delivered at home, presented clinical features of tetanus in addition to those of meningitis. Of the 5 patients in whom symptoms started during pregnancy, spontaneous termination of pregnancy occurred in 3; all these latter 3 patients died within a day of abortion or delivery.

In all patients in whom the diagnosis was established during life, chemotherapy was started. Various drug combinations were used. Penicillin and sulpha, chloramphenicol and sulpha, penicillin, sulpha and chloramphenicol, penicillin and streptomycin. Penicillin was given intramuscularly in a dose of 10 lac. units every 4 or 6 hours; chloramphenicol either intramuscularly, 1 gm. 12 hourly or 0.25 gm. intravenously 6 hourly; sulphadiazine intravenously in a dosage of 2 gms. every 6 hours, later decreasing to 1 gm. every 6 to 8 hours; streptomycin intramuscularly, 1 gm. or 0.5 gm. 12 hourly, or 1 gm. daily.

*Comments*

Bacterial and viral infections account for a large proportion of maternal deaths in tropical developing countries such as India (D'Cruz *et al*,

TABLE V  
*Out-come of Purulent Meningitis in the 10 Pregnant and Puerperal Patients and the Relation to Pregnancy*

Onset of meningitis.	Period of gestation.	Hospital stay	Fate of mother	Fate of foetus.
	2½ months	4 days	Died 5 days after onset of illness.	Undelivered.
	4½ months	13 days	Aborted 20 days after onset of illness, and died the next day.	Abortion.
During Pregnancy.	6 months.	1½ hours	Died 1 day after onset of illness.	Undelivered.
	9 months	6 hours	Delivered 3 days after onset of illness. Died 2 hours after delivery.	Full-term living.
	9 months	5 days	Onset of illness four hours before delivery. Died 1 day after delivery.	Full term iving.
	Postnatal Period.			
	Aborted at home 2 days before onset of illness.	22 hours	Died 2 days after onset of illness.	
	Delivered 10 days before onset of illness	3 days	Died 1 day after onset of illness.	
During Puerperium	Delivered at home 11 days before onset of illness.	2½ days	Tetanus was concomitantly present. Died 6 days after onset of illness.	
	Caesarean section done 19 days before onset of illness.	8 days	Died 15 days after onset of illness.	
	Delivered 2 months before onset of illness.	3 days	Died 5 day after onset of illness.	

1967); (D'Cruz and Fonseca, 1969).

The association of tuberculous meningitis with pregnancy has been repeatedly reported. Stephanopoulos in 1957 had collected a total of 37 cases including 6 of his own (Stephanopoulos 1957). We recently reported a series consisting of 32 women diagnosed as tuberculous meningitis, 11 of whom were pregnant and 21 puerperal.

However, the role of pyogenic meningitis as a complication of pregnancy or puerperium has been completely ignored hitherto to our knowledge.

The series we report here is too small for detailed statistical analysis. Nevertheless, statistical evaluation of the difference in mortality between the two groups (100% in the 10 pregnant and puerperal patients versus 59% in the 17 non-pregnant women) yielded the significant finding that the chances of such a result occurring fortitiously were only 1 in 100.

Another point worth mentioning is that 5 of the 10 patients in the pregnant and puerperal group died within 4 days of delivery or abortion. We had noted a similar unduly

high mortality during the immediate post-partum period in our patients with tuberculous meningitis (D'Cruz and Dandekar 1968).

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