

EPIDEMIOLOGICAL ASPECTS OF PARAPARTUM MENTAL ILLNESS

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Mental illnesses associated with childbearing add unforeseen complexities to prepartum care or postpartum recovery as well as to the responsibilities of marriage and parenthood. While the onset of mental illness at such a time may seem especially tragic, its obstetric background provides ancillary data that may help to identify causative elements. Comparative data are available from the information routinely collected on all maternity cases.

Over a century ago, Marcé (1858) differentiated the clinical characteristics of prepartum and postpartum mental illnesses. He found no features to distinguish prepartum psychotic and psychoneurotic disturbances from those unassociated with pregnancy. In contrast, he identified syndromes unique to postpartum mental illness.

Hamilton (1962) has further delineated the psychiatric syndromes characteristic of postpartum disturbances. The onset is insidious or sudden and the course erratic and unpredictable, as parturition is first followed by a lucid interval and the new mother is later overwhelmed by a confusion or delirium which may or may not be soon dispelled.

An epidemiological study (Paffenbarger, 1961) of obstetric and other variables in patients afflicted with psychoses after childbirth has led to further differentiation of prepartum and postpartum mental disturbances. The present paper contrasts mothers whose childbearing experience is accompanied by mental illness and those who escape such troubles. Specific obstetric variables are shown to distinguish prepartum and postpartum mental illness patients from each other and from normal childbearing women.

METHODS

To identify patients who were pregnant at the onset of a mental illness or within the previous

6 months, a review was made of the medical records of all women aged 15-44 years who were in-patients in any psychiatric hospital in Hamilton County, Ohio, 1940-58. All such women who had experienced a psychotic or psychoneurotic attack were included as study subjects, those with a record of multiple parapatum attacks being considered from the time of their *first attack*.

Events of pregnancy, labour, and the puerperium were compiled from the maternity hospital records of each mental illness patient. Comparative data were obtained from the records of the two maternity patients (control subjects) of the same race who were delivered in the same obstetric unit immediately before and after each mental illness patient.

Confidence in this method of choosing controls was gained through inspection of county and state records on perinatal events in the general population. Race-specific values for maternal age and parity, and for legitimacy, perinatal mortality, and birth weight of infants, as determined from official records, closely approximated the corresponding values for control subjects (P for each factor >0.30).

During the period of record, distinctions between psychotic and psychoneurotic patients may have varied with diagnostic fashions and rubrics. Data on these patients could be pooled for analysis, however, since the two groups were similar as regards most of the obstetric factors that proved to be associated with the development of a parapatum mental illness. Likewise, the findings for women suffering a first attack of mental illness could be pooled with those for women who had experienced a previous attack unassociated with childbearing, and findings for white and Negro subjects could be combined.

Several obstetric factors, on the other hand, differentiated prepartum from postpartum mental illness patients, and these two categories are reported separately in all analyses. Unlike the prepartum patients, the postpartum patients afforded obstetric

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data that were recorded before overt mental distortions appeared; hence, their records of pregnancy and delivery would seem to be unbiased by psychiatric symptoms.

FINDINGS

TIME OF ONSET

Of the 314 patients (259 white, 55 Negro) identified for study, 72 had onset of mental illness during pregnancy and 242 during the 6 months after delivery (Fig. 1). The ratio of psychoses to psycho-neuroses diagnosed in the prepartum group was 1:2 but in the postpartum group this ratio was reversed, 2:1. Prepartum mental illnesses were rather evenly scattered by trimester of pregnancy, while postpartum illnesses exhibited a large cluster near the time of delivery. The pattern for first attacks resembled that for the total.

Each postpartum patient had a lucid interval after parturition. 82 (34 per cent.) developed psychiatric symptoms within the first week, and 164 (68 per cent.) by the end of the first month. In nearly 80 per cent. the onset occurred during the 6-week puerperal period, and the remainder were distributed at a

steadily declining rate over the balance of the 6 months included within the period of study.

INCIDENCE

Attack rates of parapartum mental illnesses among county residents were computed for 1957 and 1958, the years of data gathering (Table I). Of 22 cases of prepartum mental illness, seventeen represented first attacks, two were recurrences in women who had previously manifested a prepartum mental illness, and three were "reactivations" of previous mental illness unassociated with childbirth. Of 83 postpartum mental illnesses, 57 were first attacks, six recurrences, and twenty "reactivations".

TABLE I
COUNTY INCIDENCE OF
PARAPARTUM MENTAL ILLNESSES, 1957-58

Onset	Age (yrs)	No. of Mental Illness Patients			Total	Rate per 10,000 Live Births
		First Attack	Recurrence	Reactivation*		
Pre-partum	15-24	3	1	1	5	2
	25-34	12	1	2	15	8
	35-44	2	0	0	2	4
	All Ages	17	2	3	22	5
Post-partum	15-24	19	0	5	24	12
	25-34	30	4	12	46	24
	35-44	8	2	3	13	28
	All Ages	57	6	20	83	19

* Previous mental illness unassociated with pregnancy.

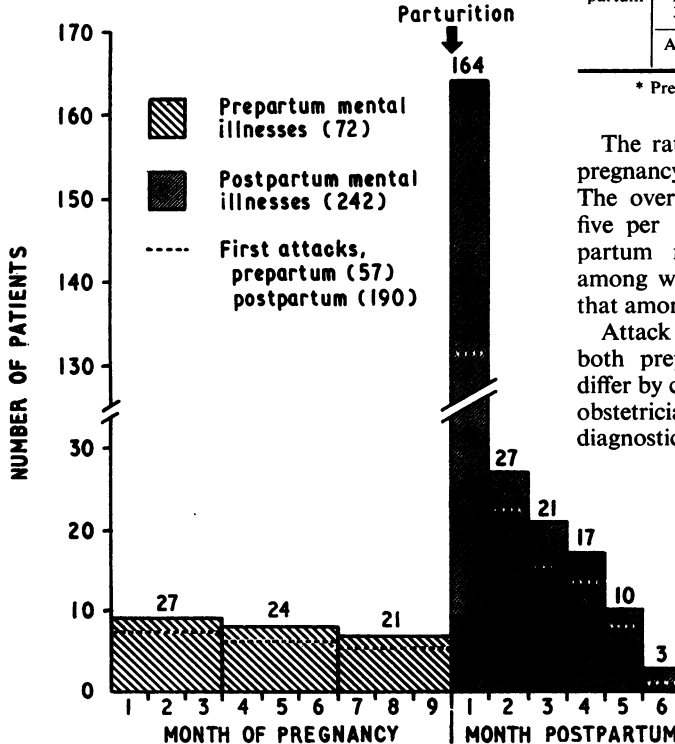


FIG. 1.—Onset of parapartum mental illnesses among hospitalized patients in Hamilton County, Ohio, 1940-58. First attacks represent women without previous mental illness.

The rates were about one-fourth as high during pregnancy as during the 6 months after parturition. The overall rate of prepartum mental illness was five per 10,000 live births, whereas that of postpartum mental illness was nineteen. Incidence among women aged 25 years or older was double that among younger mothers during each period.

Attack rates were similar for whites and Negroes, both prepartum and postpartum. Rates did not differ by civil districts, hospital services, or attending obstetricians. One artefact of hospital practices or diagnostic fashions appeared to be that Negroes were

more likely than whites to be classified as psychotic rather than psychoneurotic, in either parapartum period.

RECURRENCE

The data for 1940-58 included 72 women who became pregnant subsequent to a parapartum mental illness, thirteen having been prepartum patients and 59 postpartum. Roughly one-third of their 125 later viable pregnancies led to recurrences of mental breakdown. Former prepartum patients experienced seven recurrences (30 per cent.) in 23 subsequent pregnancies, and the postpartum patients experienced 35 recurrences (34 per cent.) in 102 subsequent pregnancies. Recurrence was invariably of the same category as the first attack, *i.e.* prepartum or postpartum, no patient shifting from one to the other in successive mental illnesses. Such consistency of timing suggested that the separate categories of illness had different causes.

Recurrence rates did not differ by race or parity, and did not increase with number of pregnancies subsequent to the first attack. The rates were higher among patients aged 25 years or older at first attack than among those who were younger.

PREVIOUS MENTAL ILLNESS

Data were limited on the incidence of mental illness unassociated with childbearing as compared with that of parapartum mental illness. Examination of *obstetric* records, however, did permit some consideration of previous attacks among the patients and control subjects in the present study. Of the 72 prepartum mental illness patients, nine (12 per cent.) reported some kind of previous mental breakdown which may or may not have led to hospitalization; the corresponding number among 242 postpartum mental illness patients was 25 (10 per cent.). In contrast, only four (1 per cent.) of the 628 control subjects had entries of this kind in their obstetric records. Thus, the previous occurrence of a mental breakdown predisposed women to a "reactivation" of mental disorder during or following pregnancy.

AGE AT PARTURITION

Distributions and mean values for age at parturition are given in Table II. The prepartum mental illness patients averaged 28, postpartum patients 27.3, and control subjects 26 years of age. These significant differences of 1 to 2 years stem from a shift of the entire age curve to an older range for mental illness patients. The distinction of an age difference is found to persist at each parity from I to V, disappearing only at VI+.

TABLE II
AGE AT PARTURITION, PATIENTS AND CONTROLS

Age (yrs)	Mental Illness Patients				Control Subjects	
	Prepartum		Postpartum		No.	Per cent.
	No.	Per cent.	No.	Per cent.		
15-19	5	7	19	8	83	13
20-24	21	29	59	24	194	31
25-29	18	25	80	33	187	30
30-34	17	24	56	23	97	15
35-39	9	12	22	9	58	9
40-44	2	3	6	2	9	1
All Ages	72	100	242	100	628	100
Mean ± S.D.	28.0* ± 5.8		27.3* ± 5.6		26.0 ± 5.9	

* Significantly different from figure for controls at <0.01 level.

Large when considered against a potential reproductive span of 30 years, the age difference between patients and controls is even more impressive within the actual span of perhaps 5 to 15 years common for multiparous mothers. As will be shown, the age difference in the parapartum mental illness patient is apparently keyed to the pregnancy associated with the mental illness.

PARITY AFTER PARTURITION

Data on birth rank are given in Table III. When adjustment is made for age differences, both prepartum and postpartum mental illness patients are seen to be of a different parity from normal women, and to vary in opposite directions. Prepartum patients averaged 3.4 pregnancies reaching 20 or more weeks of gestation, substantially higher than the 2.8 average for control subjects. Significantly fewer prepartum patients (14 per cent.) than controls (26 per cent.) were primiparae. In contrast, the postpartum patients averaged 2.5 pregnancies and included 34 per cent. primiparae, values significantly different from the control figures.

TABLE III
PARITY AFTER PARTURITION, PATIENTS AND CONTROLS

Series		Mental Illness Patients		Control Subjects
		Prepartum	Post-partum	
No. of Subjects		72	242	628
Primiparae	No. of Cases Age-adjusted (per cent.)	9 14†	71 34†	170 26
Viable Pregnancies	No. Observed No. Expected*	253 214.6	654 717.7	1,732 1,732
	Age-adjusted Mean ± S.D.	3.4† ± 1.8	2.5† ± 1.6	2.8 ± 1.7

* Expected number derived from age-specific mean numbers for controls.

† Significantly different from figure for controls at <0.05 level.

The prepartum patients had been delivered of 38 more children, and the postpartum patients of 64 fewer children, than the number expected for normal women of comparable age. These findings remain generally consistent when examined by standard age classes (Fig. 2).

In their histories of earlier pregnancies, the patients and controls did not differ as to abortion, foetal death, live births, and neonatal and infant death rates.

PREGNANCY INTERVAL

Among multiparae the intervals since the last viable pregnancy were significantly greater for parpartum mental illness patients than for control subjects (Table IV), mean intervals being 3.2 years for the prepartum patients, 3 for postpartum patients, and 2.5 for control subjects. These figures are adjusted for differences in age and parity, since the rate of reproduction usually slows towards the end of childbearing and also with higher birth rank.

TABLE IV

INTERVAL SINCE PREVIOUS PARITY FOR MULTIPARAE

Series		Mental Illness Patients		Control Subjects
		Prepartum	Postpartum	
No. of Subjects		53	148	393
Interval (yrs)	Age- and parity-adjusted Mean	3.2*	3.0†	2.5
	S.D.	±2.0	±2.4	±2.4

* Significantly different from figure for controls at <0.01 level.
 † Significantly different from figure for controls at <0.05 level.

The tendency towards longer infertile intervals is more surprising in the more parous prepartum group than in the postpartum group, the latter less parous than the controls.

Study of the intervals between earlier pregnancies revealed that significant group differences in pregnancy interval occurred only in relation to the pregnancy associated with parpartum mental illness.

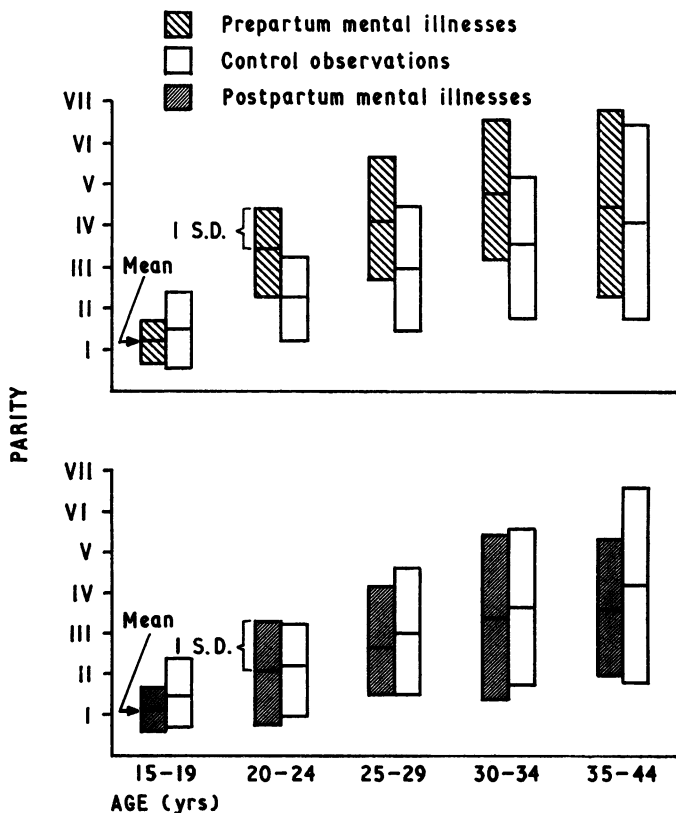


FIG. 2.—Mean parity of study subjects, by age.

OTHER SIGNIFICANT FINDINGS

The findings of group differences in age, parity, and pregnancy interval suggest differences in fertility or in risk of pregnancy. Data were not available on libido, planned parenthood, or fear of pregnancy. However, information was reviewed on other important events of womanhood that might relate to conception and childbearing.

Mean Age at Menarche.—In each study group the mean age at menarche was approximately 13 years, suggesting that the onset of physical maturity was similar.

Mean Age at Marriage.—Marriage licence applications of those married within the county showed that the mean age at application (approaching 21 years) was similar in all groups, suggesting that the onset of pregnancy risk was similar. This uniformity of age at marriage further suggests that the mean age differences of 1 to 2 years between patients and controls at parturition are related to events subsequent to marriage. A companion trend is seen among primiparous mental illness patients, who were married at the same age as primiparous controls yet were older by the time of childbearing, again suggesting longer infertile intervals for patients.

Mean Age at Earlier Births.—Multiparous mental illness patients did not differ significantly from controls in average age at any of their earlier pregnancies. Prepartum mental illness patients, however, had a tendency to be younger at each birth rank, a finding consistent with their greater overall parity. Like the other data on similarity of age at various events, as contrasted with age differences at time of mental illness, these observations suggest that causative elements become active only shortly before or during the pregnancy leading to a mental disorder.

A number of socio-cultural factors were examined that might have affected differences in age, parity, and fertility of patient and control groups. In brief, groups were similar in distribution by birthplace, urban-rural residence, geographic mobility, occupation of spouse, and illegitimacy of offspring. Thus, circumstances that might furnish clues to psychic stress presented no significant differences or trends between parapartum mental illness patients and control subjects.

GESTATION

Estimates of gestational period (Table V) show that prepartum mental illness patients and controls

averaged 39.5 and 39.6 weeks; but postpartum mental illness patients averaged a significantly shorter period, 39.1 weeks. This reduced interval was noted for each age class and parity bracket, signifying a general shift of postpartum mental illness patients toward shorter gestational periods rather than the occurrence of a few extremely short pregnancies. This difference in gestation time is corroborated by birth weight of infants, as will be shown.

TABLE V
LENGTH OF GESTATION FOR LIVE BORN SINGLETON INFANTS OF STUDY SUBJECTS

Series		Mental Illness Patients		Control Subjects
		Prepartum	Postpartum	
No. of Infants		68	232	616
Gestation (wks)	Mean	39.5	39.1*	39.6*
	S.D.	±2.1	±3.0	±2.2

* Significantly different at <0.05 level.

Parapartum mental illness patients and control subjects were alike in their scheduling and amount of prenatal medical care. The three study groups were similar in their proportions of subjects hospitalized in false labour, experiencing premature rupture of the membranes, and submitting to induced labour. The average length of labour leading to spontaneous deliveries was the same in all groups.

OBSTETRIC AND PERINATAL ABNORMALITIES

Obstetric records were reviewed for data on abnormalities of pregnancy, labour, and the postpartum period of hospitalization. No differences were found among study groups in their histories of chronic diseases or of obstetric abnormalities in earlier pregnancies. Nor were there group departures in physical characteristics such as blood type, usual nongravid weight, or gain in weight during pregnancy.

Prepartum mental illness patients, who presumably underwent both emotional and mental changes during pregnancy, did not differ significantly from control subjects in their frequencies of current obstetric variables.

Postpartum mental illness patients, on the contrary, did differ from control subjects in obstetric abnormalities of the current pregnancy. For example, several seemingly minor conditions were reported more commonly for patients. Headaches in the last trimester were recorded as more prevalent (patients 16 per cent., controls 9 per cent.). Hypertension

(systolic >145 mm. Hg or diastolic >95) during pregnancy or delivery was more common (patients 10 per cent., controls 6 per cent.). Respiratory illnesses of late pregnancy were more frequently mentioned (patients 8 per cent., controls 3 per cent.). Although these findings may relate to endocrine imbalance, their real implications are unknown.

Of more consequence, larger proportions of postpartum patients (11 per cent.) than of controls (6 per cent.) experienced dystocia (Table VI). Age and parity differences did not affect these proportions materially.

Parapartum mental illness patients and control subjects did not differ significantly in such abnormalities as pre-eclampsia, placenta praevia, abruptio placentae, or uterine haemorrhage. Neither were group differences found in types or frequencies of anaesthesia, operative procedure, or drug administration.

All of the prepartum mental illness patients produced liveborn infants, each of whom survived the first month of life. In contrast, eight (3 per cent.) of the postpartum mental illness patients produced stillborn infants, as compared with eleven (2 per cent.) of the control subjects. Also six infants (2 per cent.) of the postpartum patients and six infants (1 per cent.) of the control group died within the first month of life. The rates of perinatal mortality were significantly higher for infants of postpartum

TABLE VI
OBSTETRIC AND PERINATAL ABNORMALITIES

Series		Mental Illness Patients				Control Subjects	
		Prepartum		Postpartum		No.	Per cent.
		No.	Per cent.	No.	Per cent.		
No. of Subjects		72	100	242	100	628	100
Dystocia	Malpresentation*	3	4	19	8	30	5
	Cephalopelvic disproportion	0	—	4	2	1	<1
	Uterine dysfunction	0	—	7	3	7	1
	Any of above	3	4	26	11†	35	6
Perinatal Mortality	Foetal deaths	0	—	8	3	11	2
	Neonatal deaths	0	—	6	2	6	1
	Total deaths	0	—	14	6†	17	3

* Any presentation other than an uncomplicated vertex.
† Significantly different from figure for controls at <0.05 levels.

mental illness patients (6 per cent.) than for those of controls (3 per cent.). Adjustments for age and parity differences did not alter these findings appreciably.

Obstetric records permitted a crude comparison of the physical condition of the newborn infants at birth. Two (3 per cent.) of 72 liveborn infants of prepartum mental illness patients and nineteen (9 per cent.) of 219 infants of postpartum mental illness patients were listed as in relatively poor condition, as against thirty (5 per cent.) of 602 infants of control subjects. No material differences between study groups were found in sex of infant, birth injury, or congenital defect. Equal proportions of patients and controls were feeding their infants at breast, bottle, or combination, upon discharge from the obstetric hospital.

BIRTH WEIGHT

Infants of prepartum mental patients and those of control subjects were similar in birth weight.

Fig. 3 gives the distribution by birth weight of live born singleton infants of postpartum mental illness patients and controls. In keeping with their reduced gestation time, the infants of these patients show a mean birth weight 150 g. less than that of the

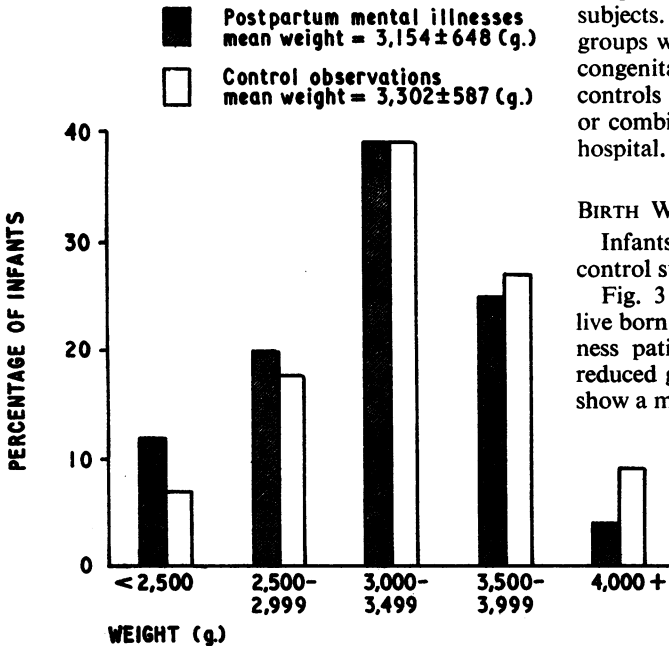


FIG. 3.—Birth weight of live born singleton infants of postpartum mental illness patients and control subjects.

control infants. With allowance for differences in maternal age and parity, this weight deficit increases to nearly 175 g. The trend is constant in subgroups distributed by age, parity, race of mother, and sex of infant.

Among multiparous patients the birth weight of infants born at earlier pregnancies unaccompanied by mental illness were similar to those of control infants. This observation re-emphasizes the association of somatic abnormalities with the pregnancy followed by a mental illness.

DISCUSSION

The incidence of parapatrum mental illnesses has not been reduced (Hamilton, 1962) during the past 100 years in which maternal and perinatal morbidity and mortality have steadily declined. Preventive measures have failed to reach the causes of mental disturbances associated with childbirth. The findings of the present study offer evidence of a relationship between these disturbances and easily-discerned obstetric variables, particularly group differences in age, parity, and latest pregnancy interval, which imply differences or alterations in fertility or in risk of pregnancy.

In contrast to normal childbearing women, prepartum mental illness patients are older, of higher birth rank, and record a longer interval between their last preceding and latest pregnancies. These circumstances suggest that a prepartum emotional conflict may have developed over a possibly unwanted pregnancy. The random timing of onset and the preponderance of psychoneurotic illnesses are consistent with this view.

Postpartum mental illness patients also are older and delayed in their latest pregnancy, but are notable for the 4-fold greater incidence and the abrupt onset of their psychiatric disturbances, as well as for their lower parity status which is quite in opposition to the increased parity of the prepartum mental illness patients. These distinctions support the view that postpartum mental illnesses arise from conditions more deeply somatic than those which lead to prepartum disturbance. Perhaps this causation of postpartum illness is related to endocrine imbalance, as is further suggested by the shortened gestation in postpartum mental illness patients and by their increased dystocia and other obstetric abnormalities. While the present study has not included data on delirium and other clinical aberrations that are widely considered to arise from hormonal upset, appreciable parallels are to be noted between those

salient psychiatric characteristics of postpartum mental illnesses and the obstetric abnormalities reported here.

SUMMARY

In a large community, the attack rate of prepartum mental illness was five per 10,000 live births, while that of postpartum mental illness was nineteen, a 4-fold difference. Rates were higher for older than for younger mothers, and one-third of subsequent pregnancies led to a recurrence of mental illness, always in the same parapatrum category as the first disturbance. Previous mental breakdown unassociated with childbearing predisposed to mental disorder during or after the pregnancy.

Patient and control group differences in age, parity, and pregnancy interval all coincided with the pregnancy associated with the mental illness. The mental illness patients averaged 1 to 2 years older. Age-adjusted parities showed an excess for prepartum and a deficit for postpartum patients, although both groups had had longer intervals since their previous pregnancy than the controls.

Despite emotional or psychic changes encountered during pregnancy, the prepartum mental illness patients resembled the controls in frequency of obstetric abnormalities and in fate of offspring. The postpartum mental illness patients, by contrast, had shorter gestation periods, stormier pregnancies, more dystocia, and infants of lighter birth weight and higher perinatal mortality. Patients and controls did not differ in socio-cultural indices, such as illegitimacy of offspring, place of residence, occupation of spouse, or mobility pattern.

Both prepartum and postpartum mental illnesses seem to be associated with lowered fertility or with reduced risk of pregnancy. Differences between the respective groups of patients lead to the speculation that prepartum mental illnesses are chiefly psychic or emotional in origin, while postpartum disturbances are more probably somatic in origin and related to endocrine imbalance.

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