Article

The General Fertility Rate in Women With Psychotic Disorders

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Objective: This study determined the general fertility rate and age-specific fertility rates for women with psychotic disorders.

Method: This historical matched-cohort study of patient records from a primary care database (the General Practice Research Database) was carried out for women of childbearing age (15–44 years) with psychotic disorders.

Results: The women with psychotic disorders (N=7,936) had a lower overall general fertility rate than the normal comparison subjects (N=23,023), although fertility was only significantly lower in the women aged 25 and above. This lower fertility rate was less marked in women with affective psychoses. There was no evidence that treatment with neuroleptics influenced the fertility rate in women with nonaffective psychoses.

Conclusions: This study found markedly lower fertility rates in women with psychotic disorders than in matched normal comparison subjects, particularly in women with nonaffective disorders. Knowledge of fertility rates in women with psychotic disorders is fundamental for clinicians and researchers, since it has implications for family planning services, prevention of obstetric complications, child-care support, and hypotheses about the etiology of these disorders.

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It is important to know whether women with psychotic disorders have children as often as women in the general population since this may have major implications for the delivery of services to these patients and their children. It has been thought traditionally that women with schizophrenia are subfertile compared with women without psychotic disorders (1). Studies of patients in the early and mid-20th century (2–5) consistently reported low fertility rates in women with schizophrenia, but this research was mainly retrospective, covered small groups of selected patients, and did not examine reproduction over the whole reproductive period.

More recent studies have provided conflicting results regarding fertility rates in women with psychotic disorders (6–13). For example, a cohort study reported no differences in fertility between women with schizophrenia and comparison subjects (8), but cross-sectional surveys have found lower fertility rates in affected women (9, 10), although with less of a fertility differential between women with psychoses and comparison subjects than was previously reported (10). Some authors have also reported lower fertility rates across diagnostic categories of psychosis (11–13), while most other studies have reported a reduction in fertility rates predominantly in women with schizophrenia. These different results may reflect differences in severity of illness, the use of comparison groups not derived from the same population as the patient groups, a failure to control for age, and the use of small selected study groups.

In addition, most studies examining fertility rates in women with psychoses have used the presence or absence of offspring, or the number of children a woman has had, as an indicator of fertility. However, fertility is more accurately measured by using the formula for the general fertility rate (births in 1 year × 1,000/number of women aged 15–44 at midyear). The general fertility rate is a useful measure of fertility, although it conceals variations by age; the age-specific fertility rate (number of births in 1 year × 1,000/women in age group at midyear) is a more precise measure of fertility, since it is calculated for each 5-year age band. These ratios represent the total yearly registered births to the population of women of childbearing age.

The aim of this study was to calculate the general fertility rate and the age-specific fertility rates for women with different psychotic disorders and to compare these with the rates for normal comparison subjects while controlling for age and neighborhood of residence. We also aimed to investigate mediating factors by examining the size of the psychosis effect after variables such as contraception and neuroleptic therapy were individually entered into multivariate analyses. We hypothesized that there would be no difference in the general fertility rates for the women with psychotic disorders and the normal comparison subjects after entering contraceptive use and substance misuse into the analyses but that patients for whom neuroleptics were prescribed would have a lower general fertility rate than patients for whom neuroleptics were not prescribed.

Method

Study Design

This historical matched-cohort study of records from the General Practice Research Database (14) was carried out for women of childbearing age (15–44 years) from 1996 to 1998. The General Practice Research Database was set up in 1987 and contains the computerized medical records of more than 3.5 million patients in primary care in England and Wales. Registration with a general practitioner is required for all initial physical and mental health assessments in the United Kingdom. In April 1996, 480 practices were participating in the General Practice Research Database, but the number of participating practices subsequently decreased (to 376 by Jan. 1, 1997) because of "year-2000" software compliance problems.

The data recorded includes details of prescriptions, clinical events, preventive care, referrals to specialists, hospital admissions, and major outcomes. Clinical data are stored and retrieved by the Oxford Medical Information System or Read codes that are cross-referenced to ICD-10. The data are audited regularly, and the participating general practices are subjected to a number of quality checks by the Office for National Statistics, including internal validation by cross-checking data within practices and in comparisons with national statistics. Practices that do not comply with this quality control (i.e., are not "up to research standard") are removed from the database.

Study Population

All women aged 15–44 years as of Jan. 1, 1997, who had at any time been registered with a general practice on the General Practice Research Database that was up to research standard for at least 1 year and had a recorded diagnosis of a psychotic disorder were identified. All psychotic disorders, including drug-induced or alcohol-related psychoses, were included—other than organic mental disorders (ICD-10 F00–F09 diagnoses). The patients who were taking depot neuroleptic medications, atypical oral antipsychotics, or lithium were also identified in an additional strategy for locating patients with psychotic disorders, but the patients without specific diagnoses were not included in analyses involving specific diagnoses. Cohorts of women aged 15–44 who were registered with general practices in 1996, 1997, or 1998 with a history of psychosis (up to and including the index year) were then identified. Some women were therefore included in each cohort for each year if they remained registered with a General Practice Research Database practice for all 3 index years. Other women were included for only 1 or 2 of the index years. Cohorts of normal comparison subjects were established by identifying up to four (where possible) women matched for general practice and age (± 2 years) for each subject; matched patients formed a "cluster." We aimed to locate four comparison subjects for each subject with psychosis to increase the power of the study.

Measures

All recorded diagnoses of psychotic disorders on the database were extracted for each patient and mapped onto ICD-10 categories. Factors associated with fertility (age, contraceptive use, antipsychotic therapy, substance misuse, and irreversible causes of nonconception, such as sterilization and hysterectomy) were identified in the index and preceding years and considered potential mediating factors. Male infertility or sterilization were recorded in partners' records and were therefore included. Reversals of sterilization were recorded, so that the subjects' exposure status was updated where appropriate.

For each year, patients aged 15–44 only were included (for 1996, we used patients aged 15–43 years because of the data extraction method) to allow comparison with national rates. Data for exposure to antipsychotic medication (in the index year and the year before) were extracted, and data for medication use were grouped into oral typical, oral atypical, and depot medications. Age was recoded into 5-year bands to calculate age-specific fertility rates. All live births were identified in each index year for calculation of general fertility rates.

Data obtained from this data set for 1996 were compared with data from the General Household Survey (15) to assess its validity. (The General Household Survey was an interview survey of a nationally representative sample of the U.K. population performed from April 1995 to March 1996.) Other sources of data collected during the same time period (e.g., in research papers, surveys) were used if the data were not available in the General Household Survey.

Statistical Analysis

Stata version 6 (16) was used for the analysis. Descriptive analyses were initially carried out for the individual cohorts in 1996, 1997, and 1998, including analyses of general fertility rates for the subjects with psychosis and the comparison subjects. The data were then merged for further descriptive analyses. Logistic regression models were used for examination of dichotomous outcomes, and Poisson regression models were used for examination of rates. Linear regression is sometimes applied to count data, but it can lead to inefficient, inconsistent, and biased estimates (17); Poisson regression is more appropriate. Here the probability of a count (number of births) is determined by the mean of a Poisson distribution, whose logarithm is a linear function of independent variables (e.g., patient group). The exponentiated coefficients of the linear function are the rate ratio for unit changes in the independent variables. By including an exposure (the number of women), the regression effectively models rates.

The lack of independence resulting from matching can be dealt with by using specialized Poisson models that include random effects (the "rpoisson" command) and a robust variance estimator, with the matched group identified as the clustering variable. (Random effects represent any unmeasured effects common to members of a cluster that result in correlation.) This approach did not deal with correlation within particular subjects over the 3 years. As a check, therefore, a three-level random-effects model was also fitted, by using the command "gllamm6" (18), with separate random effects for both subjects and for the matched groups. Random effects for specific subjects were negligible if matched-group effects were included in the model; the two-level model gave results that were almost identical to those of the model with the matched group functioning as a single clustering variable. The latter is therefore presented here.

Results

Validity of Data

The group of patients with diagnosed psychotic disorders (N=6,306) consisted of 27.0% (N=1,705) patients with affective psychoses, 72.2% (N=4,556) with nonaffective functional psychoses (including schizoaffective disorder), and less than 0.7% (N=45) with substance-related psychoses. These proportions are similar to those found in an epidemiologically representative group of patients with psychosis who were identified in South London (19). The validity of the diagnoses recorded on the General Practice Research Database could not be individually ascertained, but an examination of case notes from practices in the General Practice Research Database found that the sensitivity, specificity and predictive values of the diagnostic categories for psychoses were more than 90% (20). Analysis

of the General Practice Research Database (21) revealed a prevalence for schizophrenia of 29.2 per 10,000 patients in 1996 and 30 per 10,000 patients in 1997 (21), which is similar to previous estimates of the incidence and prevalence of schizophrenia in the United Kingdom (19, 22).

Contraceptive data for 1995 were compared with data from the General Household Survey. Prescriptions for parenteral progesterone-only contraceptives were at similar levels in the two data sets: 1% of the women aged 16–49 reported using injectable contraceptives in the General Household Survey, with higher (2%) levels of use among 18–34-year-olds. A total of 1.6% of the comparison subjects aged 15–43 in the General Practice Research Database and 2.5% of those aged 18–30 had a record of injectable contraceptive use. Oral contraceptive use was reported by 25% of the women aged 16–49 (49% in the women aged 20–24) in the General Household Survey. A total of 25.4% of the comparison subjects aged 15–43 in the General Practice Research Database and 44% of the comparison subjects aged 20–24 had received prescriptions for oral contraceptives.

The prevalence of drug problems in women with psychosis who were in contact with psychiatric services in South London (7.7%) (23) was similar to that found in our subjects with psychosis (5.1%). Drug dependence was found in 1.5% of the women in the general population (22) in the Office of Population Censuses and Surveys National Psychiatric Morbidity Survey in 1995, compared with 0.4% of our comparison subjects.

The 1995 Health Survey for England (24) found that 8%–10% of women aged 15–44 drank more than three units (1 unit of alcohol=10 ml or 8 g of absolute alcohol) per day; 5.5% of the comparison subjects from the General Practice Research Database drank more than three units per day in 1995. A study of dual diagnosis in patients with psychotic disorders who were in contact with psychiatric services in South London found a prevalence of 20% for alcohol problems in women (23), although these patients are not directly comparable with the primary care population in our study. A total of 4.2% of the subjects with psychosis from the General Practice Research Database were recorded as drinking more than three units per day in 1995 (with similar patterns in subsequent years). Alcohol intake was recorded for 15.6% of the subjects with psychosis and for 15.2% of the comparison subjects. There was, therefore, no evidence of differential recording. Alcohol problems may, however, be underrecorded and undetected by general practitioners using the General Practice Research Database, particularly for women with psychotic disorders. Therefore, we did not include data regarding alcohol misuse in our analyses (although when models were examined, including those with alcohol misuse, there were no substantial differences in the results).

Demographic Characteristics and General Fertility

For 1996 there were 3,113 subjects with psychosis and 9,216 matched comparison subjects. The subjects with psychosis were a mean age of 34.1 years (SD=6.6), and the comparison subjects were a mean age of 34.4 years (SD=6.6). The subjects with psychosis were followed up for a median of 366 days (range=3–366, interquartile range=305–366), and the comparison subjects were followed up for a median of 366 days (range=1–366, interquartile range=315–366) (Mann-Whitney z=0.87, p=0.39). A total of 2,495 (80.1%) of the subjects with psychosis had been identified by finding a diagnosis of psychotic disorder on the General Practice Research Database.

For 1997 there were 2,720 subjects with psychosis and 8,014 matched comparison subjects. The mean age was 34.8 years (SD=6.8) for the subjects with psychosis and 35.1 years (SD=6.9) for the comparison subjects. The subjects with psychosis had been registered with a practice participating in the General Practice Research Database for a median of 365 days (range=1–365, interquartile range=365–365), and the comparison subjects had been registered for 365 days (range=1–365, interquartile range=351–365) (Mann-Whitney z=0.99, p=0.32). A total of 2,151 (79.1%) of the subjects with psychosis had been identified by a search for a diagnosis of psychotic disorder on the General Practice Research Database.

For 1998 there were 2,103 subjects with psychosis and 5,793 matched comparison subjects. The mean age was 34.3 years (SD=6.8) for the subjects with psychosis and 34.6 years (SD=6.6) for the comparison subjects. The subjects with psychosis had been registered with a practice participating in the General Practice Research Database for a median of 346 days (range=8–365, interquartile range=297–365), and the comparison subjects had been registered for 346 days (range=5–365, interquartile range=297–365) (Mann-Whitney z=0.60, p=0.55). A total of 1,660 (78.9%) of the subjects with psychosis had been identified by a search for a diagnosis of psychotic disorder on the General Practice Research Database.

The general fertility rates by year for the patients and comparison subjects are given in Table 1, with the ratios of rates comparing the subjects with psychosis and the comparison subjects. The general fertility rate for the comparison subjects was stable throughout the 3 years of the study. However, the general fertility rate for the patients with psychosis tended to decrease over time, although the change was not statistically significant. There was no significant interaction between subject group and year (χ^2= 5.13, df=2, p=0.08, likelihood ratio test in a Poisson model of the rate ratio for general fertility).

Descriptive Analysis of Combined Data

In this study there were 7,936 subjects with psychosis and 23,023 comparison subjects. A total of 6,306 (79.5%) of the subjects with psychosis had a diagnosis of a psychotic

TABLE 1. General Fertility Rates for Women of Childbearing Age With Psychotic Disorders and Normal Comparison Subjects in the General Practice Research Database

	General Fertility Rate ([births in 1 year × 1,000]/number of women aged 15–44[a])				Rate Ratio (patients/comparison subjects)		Analysis	
	Patients With Psychotic Disorders		Normal Comparison Subjects					
Year	Rate	95% CI	Rate	95% CI	Ratio	95% CI	z	p
1996	31.5	25.6–39.2	45.8	41.1–50.9	0.69	0.54–0.87	–3.13	0.002
1997	22.3	17.2–29.3	42.1	37.7–47.2	0.53	0.40–0.71	–4.31	0.001
1998	19.0	13.5–26.7	44.3	38.8–50.5	0.43	0.30–0.62	–4.59	<0.001

[a] Age was defined as age at midyear.

disorder recorded at any time up to the index year. A total of 2,104 (33.4%) of the subjects had schizophrenia, 349 (5.5%) had schizoaffective psychosis, 1,078 (17.1%) had paranoid psychosis, 1,141 (18.1%) had bipolar psychosis, 211 (3.3%) had puerperal psychosis, 38 (0.6%) had drug-related psychosis, seven (0.001%) had an alcohol-related psychosis, 353 (5.6%) had depressive psychosis, and 1,025 (16.3%) had psychosis not otherwise specified.

Contraceptive use in the year preceding the index year was less common in the subjects with psychosis than among the comparison subjects; 28.8% of the subjects with psychosis and 32.3% of the comparison subjects were recorded as using contraception (odds ratio=0.84, 95% confidence interval [CI]=0.80–0.89) (χ^2=36.32, df=1, p<0.001).

Irreversible causes of nonconception (hysterectomy, bilateral oophorectomy, menopause, male infertility, sterilization in male partners or the subjects) were identified for the years preceding the index years. These conditions were more common in the comparison subjects than in the patients: 8.7% of the subjects with psychosis and 10.7% of the comparison subjects (odds ratio=0.79, 95% CI=0.72–0.86) (χ^2=27.77, df=1, p<0.001). The subjects with psychosis were less likely to have had a sterilization than the comparison subjects—4.9% of the subjects with psychosis and 5.6% of the comparison subjects (odds ratio=0.88, 95% CI=0.78–0.98) (χ^2=5.00, df=1, p=0.03)—or to have partners who were recorded on the woman's record as having had a vasectomy—1.2% of the subjects with psychosis and 2.2% of the comparison subjects (odds ratio=0.53, 95% CI=0.42–0.66) (χ^2=32.78, df=1, p<0.001).

In 1995 1,359 subjects with psychosis (43.7%) had a prescription for oral neuroleptics, and 296 (9.5%) had a prescription for depot antipsychotic medications. A total of 47.8% of the subjects with psychosis had a prescription for an antipsychotic drug as did 61.6% of the subjects with psychosis with a diagnosis of schizophrenia. No patients received atypical antipsychotics. A total of 71% (N=176) of all patients with a prescription for depot antipsychotics had a diagnosis of schizophrenia. By 1998 14% of these patients were taking atypical antipsychotics, 41% were taking oral neuroleptics, and 7% were taking depot neuroleptics. Overall, for the whole data set, 6.2% of the patients with schizophrenia and related disorders had a prescription for atypical antipsychotics compared with 1.3% of the patients with affective disorders (χ^2=57.89, df=1, p<0.001). No comparison subjects received a prescription for antipsychotics. Women in successively older age bands were more likely to have a prescription for typical neuroleptics (odds ratio=1.20, 95% CI=1.15–1.24) (z=9.34, p<0.001, adjusted for year and diagnosis). The subjects with psychosis were more likely to have misused drugs: illicit drug misuse was recorded in 0.6% of the comparison subjects and 5.6% of the subjects with psychosis (odds ratio=12.7, 95% CI=10.3–15.7) (χ^2=918.00, df=1, p<0.001).

The associations between these variables and fertility were then examined for the entire group of women. The general fertility rate ratio for users of any form of contraception compared with that of nonusers was 0.98 (95% CI=0.87–1.12) (χ^2=0.06, df=1, p=0.80), and the general fertility rate ratio for irreversible causes of nonconception was 0.45 (95% CI=0.34–0.59) (χ^2=31.16, df=1, p<0.001). The general fertility rate ratio for the patients for whom neuroleptics were prescribed compared with those for whom they were not prescribed was 0.47 (95% CI=0.36–0.61) (χ^2=32.57, df=1, p<0.001). The general fertility rate ratio for illicit drug use was 1.15 (95% CI=0.73–1.80) (χ^2=0.37, df=1, p=0.55).

Multivariate Analysis

The association between subject group and general fertility rate remained significant after adjustment for year: the rate ratio for the subjects with psychosis versus the comparison subjects was 0.57 (95% CI=0.48–0.67). There was a significant interaction between subject group and age (Wald χ^2=14.64, df=5, p=0.01). The age-specific ratios of rates for the subjects with psychosis and the comparison subjects were therefore obtained, with adjustment for year (Table 2). The model did not change when irreversible causes of nonconception, contraceptive use, or substance misuse were included.

The effect of diagnosis was then examined (substance-related psychoses were excluded because of the small patient group involved, and puerperal psychoses were excluded because of their unclear nosological status). The rate ratio for the general fertility rate in women with affective psychoses (bipolar and depressive psychoses) compared with that of the comparison subjects was 0.66 (95% CI=0.47–0.91) (z=–2.51, p=0.01) after adjustment for year. The general fertility rate ratio, with adjustment for year in the women with nonaffective psychoses (i.e., schizophrenia, schizoaffective psychosis, paranoid psychosis, and

TABLE 2. Age-Specific Fertility Rates for Women of Childbearing Age With Psychotic Disorders and Normal Comparison Subjects in the General Practice Research Database

	Number of Births		Age-Specific Fertility Rate ([births in 1 year × 1,000]/women in age group[a])		Analysis	
Age Group (in years)[a]	Patients	Comparison Subjects	Rate	95% CI	z	p
15–19 (N=789)	7	16	1.41	0.58–3.42	0.75	0.45
20–24 (N=2,447)	30	94	0.88	0.58–1.33	–0.60	0.55
25–29 (N=4,509)	47	198	0.62	0.45–0.86	–2.90	0.004
30–34 (N=6,793)	50	333	0.41	0.30–0.55	–5.96	<0.001
35–39 (N=8,316)	31	198	0.47	0.32–0.68	–3.93	<0.001
40–44 (N=8,105)	6	36	0.53	0.22–1.28	–1.41	0.16

[a] Age group was defined as age at midyear.

psychosis not otherwise specified), compared with that for the comparison subjects was 0.46 (95% CI=0.36–0.58) (z=–6.66, p<0.001).

In consideration of the subjects with psychosis only, in comparing the women with nonaffective psychoses with the women with affective psychoses, the general fertility rate ratio was 0.68 (95% CI=0.45–1.01) (z=–1.91, p=0.06), with adjustment for year and subject age. There was a significant effect of age (χ^2=33.9, df=5, p<0.001) and a less-than-significant effect of year (χ^2=3.86, df=2, p=0.15) in these analyses. There were no significant effects of contraceptive use, irreversible causes of nonconception, or neuroleptic use on fertility (the rate ratio for diagnosis was not changed when these variables were included in the model). Nor were there significant interactions between diagnosis and these variables, other than neuroleptic use, which was at a less-than-significant level (z= 1.74, p=0.08). For the women with schizophrenia and related disorders, the general fertility rate ratio with neuroleptic use was 1.12 (95% CI=0.72–1.76) (z=0.51, p=0.61), whereas for women with affective psychoses, the general fertility rate ratio with neuroleptic use was 0.52 (95% CI= 0.25–1.10) (z=–1.72, p=0.09).

Discussion

This study found that fertility in women with psychotic disorders, particularly nonaffective psychoses, was markedly lower than in normal matched comparison subjects. This significantly lower general fertility rate did not appear in younger women with psychotic disorders but was apparent in subjects with psychosis aged 25 and over. This study used a larger and more representative population than previous studies, and it is therefore more likely to provide an accurate assessment of fertility in women with psychotic disorders.

Some authors have argued that since lower fertility has been consistent throughout the 20th century and has been reported in younger and older subjects, lower reproductive fitness in patients with schizophrenia may be an inherent part of the illness (25). Our finding of normal rates of general fertility in younger subjects with psychosis (and in younger women with nonaffective psychoses only) does not support this theory, although this may be due to the small numbers of subjects in these age groups.

The age differences in fertility may be explained by age at onset of illness or parity, but such data were not available for this study. However, age at onset was not found to influence fertility or fecundity in previous research in which this information was available (8). Alternatively, younger women may be treated with lower-dose neuroleptics, which are less likely to cause hyperprolactinemia and its associated reductions in fertility than higher doses of these drugs. Information on dosage was, unfortunately, not available, but older women were more likely to be prescribed typical neuroleptics than women in younger age groups. Young women may be more likely to receive prolactin-sparing neuroleptics, but these were used in only small numbers of patients in primary care at the time these data were collected.

When variables with effects on fertility were added to subsequent models of subjects with psychosis, there was a less-than-significant effect resulting from the interaction of neuroleptic treatment with diagnosis. Neuroleptic treatment did not appear to have an effect on the fertility of women with nonaffective psychoses, but women with affective psychoses for whom neuroleptics were prescribed were more likely to have lower fertility rates than women for whom neuroleptics were not prescribed. A study of patients with first-onset schizophrenia (26) also found lower fertility in these patients, again suggesting that medication side effects were not the cause of the lower fertility. It therefore appears that other factors are more powerful influences than medication on fertility in women with more severe psychoses.

A low rate of marriage may explain the low fertility rate in women with psychotic disorders, but information on marital status was not available in the General Practice Research Database. Women with schizophrenia are less likely than women with affective psychosis to have stable relationships (4, 9, 10), probably as a result of the impact of the illness on affect and behavior. Illness factors may therefore lead to lower fertility through their effect on the patient's ability to make and sustain relationships. Where patients do have partners, the partner's psychiatric history may also be relevant in influencing fertility (9).

Methodological Limitations

Information from the General Practice Research Database is known to be representative of the general population in comparison with data from the 1991 census (14). However, some individuals are not registered, or have no contact, with a general practitioner (5% of the patients with psychosis were not in contact with general practitioners in a study of all patients with psychosis in South London [19]), which may lead to selection bias, although this should be limited, since only small proportions of patients were involved.

We used the General Household Survey and national statistics to assess the validity of data where possible. Data regarding oral and depot contraceptive use appeared to be reliable, but women could choose to go to family planning clinics rather than their general practitioner for contraceptives. This could explain why contraceptive use was not associated with lower fertility. Our inclusion criteria for subjects with psychosis meant that some women were not actively ill during the index years; this may also explain the relatively low rates of antipsychotic prescriptions found here. We matched normal comparison subjects by general practice, as a proxy for neighborhood and socioeconomic status, but there is some debate as to how accurately neighborhoods can act as a proxy for socioeconomic status (27).

Conclusions

This study shows that women with psychotic disorders have a lower general fertility rate than that found in matched normal comparison subjects. The design of this study could not address trends over many years, but it provides a benchmark of the fertility rates of women with different psychotic disorders in the United Kingdom in the 1990s. It provides important information for clinicians and researchers, with implications for services and hypotheses about the etiology of these disorders. For example, reports of an excess of obstetric complications in women with schizophrenia have possible implications for the primary prevention of schizophrenia (28, 29), and the feasibility of services designed to optimize antenatal care in this group cannot be estimated without knowledge of the fertility rate in these patients.

Similarly, services to assess parenting, and the development of interventions to increase support for child care and parenting skills in this population, also require information on the rate of pregnancy in women with psychosis to estimate the potential need for such services. Assumptions about fertility in patients with psychotic disorders have often been central to hypotheses about the etiology of these disorders (1), so a detailed study of the incidence of pregnancy in these women is therefore also helpful to researchers.

Future prospective studies could help identify the mechanisms involved in the lower birth rate in patients with psychosis by collecting information on partners, parity, socioeconomic status, contraception, substance misuse, and antipsychotic medication and by documenting any prospective changes in fertility. Studies that can provide good estimates of the general fertility rate in women with psychoses will help in the planning of services for women with psychotic disorders, which should include provision of family planning and support for patients who do have children.

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