Psychopathology in the Children (Ages 6–18) of Depressed and Normal Parents

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Data from a pilot family-history study of 194 children (ages 6–18) of probands with major depression compared with the children of normal controls showed children of depressives were at increased risk for psychological symptoms, treatment for emotional problems, school problems, suicidal behavior, and DSM-III diagnoses. The magnitude of the risk was increased 3-fold for any DSM-III diagnosis in the children of depressed probands. Major depression was the most common psychiatric disorder, followed by attention deficit and separation anxiety. The risk to children of major depression and of any DSM-III diagnosis increased linearly if both parents were psychiatrically ill than if only one or neither parent had psychiatric illness. Other significant predictors of risk to children were early onset of the proband's depression, an increased number of the proband's first-degree relatives who were ill with any psychiatric disorder and/or major depression, and if the proband was divorced, separated or widowed. While diagnoses were based on multiple informants and were made by a psychiatrist who was blind to the clinical status of the probands, the absence of direct interviews with the children make these findings preliminary. A direct interview study is under way.

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Although there has been considerable interest in the offspring of psychiatrically ill parents, most of the systematic research has been conducted on the children of schizophrenic parents (Erlenmeyer-Kimling et al., 1984a, b; Garmezy, 1974; Garmezy and Streitman, 1974). The few available studies of the children of depressed parents suggest that these children are at increased risk for psychiatric and behavioral problems and that children with both parents affected are at even greater risk (Fischer and Gottesman, 1980). These studies, however, contain methodologic problems that make results difficult to compare among them (Orvaschel, 1982).

Our interest in the children of depressed parents began during a case-control study we conducted over 10 years ago when we observed that affected depressed women, compared with normal nonpsychiatrically ill women in their neighborhood, were more irritable and resentful of their children, as well as less affectionate and involved with them. The depressed woman's problems with her children persisted even after she had recovered (Weissman and Paykel, 1974). Moreover, the children continued to manifest many problems long after their mother's recovery (Weissman et al., 1972). Because these earlier studies focused on the social and interpersonal relationships of depressed women, the children's problems were not systematically assessed. These studies, however, led to our current interest in genetic-family studies of children of depressed parents.

This paper presents our preliminary data comparing the offspring (ages 6–18) of probands with major depression to the offspring of normal controls. It differs from many previous studies in that: (1) a matched control proband group is included for comparison purposes, (2) DSM-III diagnoses are made on

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children, (3) a large sample of children is included, and (4) best estimate diagnoses in children are made blindly with respect to the clinical status of the proband. However, this is a pilot study in that the data are based on parents' reports of their children rather than direct assessment of the children.

We now have under way a large-scale study incorporating direct interviews of these children.

Method

Design

The subjects studied were the children, ages 6–18, of probands from a family-genetic study of affective disorders in adults. The probands of the children studied were adults (18 years and older) and derive from one of the following groups: severe major depressives (with severity defined as hospitalization) (N = 44); mild major depressives (i.e., ambulatory, never hospitalized) (N = 89); or a normal never psychiatrically ill control group (N = 82) drawn from a community sample in New Haven, Connecticut.

The proband groups were white and group matched by age and sex. All of the depressed probands were primary nonbipolar depressives. The diagnostic assessment of the probands was based on RDC criteria following a modified SADS-L interview. The full details of that study, including design, diagnostic procedures, and findings, have been described elsewhere (Weissman et al., 1982, 1984).

In this report the results from the severe and mildly ill depressed probands are combined in order to increase the sample size of children. Future analyses will examine the effect of severity and subtype of parental illness on children's psychopathology (Leckman et al., 1983a, b), and an additional comparison group of children of bipolar patients will also be provided by Elliot Gershon, M.D., of the National Institute of Mental Health (Gershon et al., 1982).

In the original family study of adults, comprehensive diagnostic estimates of probands, spouses, and all adult first degree relatives, including children over age 18, were obtained blindly through direct interview, family history from multiple informants, and medical records when available.

Children aged 18 and under were not interviewed directly. Instead, information on minor children was obtained by family history from the proband, spouse, and other first degree relatives. The data on children presented in this report always refer to the probands' children ages 6 to 18, unless otherwise stated.

Assessment of Children

A screening instrument administered to the proband, spouse and all first degree relatives was used to determine symptoms of psychopathology, behavioral problems, and psychological treatment in any of their children who were aged 6–18 at the time of the proband interview. First, there was a general probe about problems with the child, and then a symptom list was read to the informant which covered questions about the child's psychological treatment, special school, school difficulty, hyperactivity, delinquency, phobias, obsessions and compulsions, depression, suicidal behavior, bodily complaints, anxiety, psychotic symptoms, and substance abuse. Information was obtained separately for each child. Children under the age of 6 were excluded from such assessment because of its inappropriateness for that age group. When there were positive answers to symptoms, the interviewers were instructed to code them and to record details in a narrative form as well.

Best Estimate DSM-III Diagnosis of Children

A best estimate diagnosis based on DSM-III was made by a psychiatrist (G.D.G.) with clinical and research training in child psychiatry, who was not involved in the original data collection and who was blind to the clinical status of the proband. All available information on the child from parent's reports and medical records was reviewed as part of the diagnostic process. The general method used to assign best estimate diagnoses has been described in detail elsewhere (Leckman et al., 1982). The diagnostic categories used in this study include: major and minor depression, attention deficit disorder, conduct disorder, panic disorder, separation anxiety, obsessive-compulsive disorder, and suspected developmental reading disorder. Estimates of agoraphobia, social or simple phobia, drug substance abuse, and psychoticism were also made, although data concerning these categories were not as systematically collected in as much detail on the child's symptom checklist, and more reliance was placed on narrative summaries.

Results

Characteristics of Children

Table 1 shows the age and sex distributions of children ages 6–18 by proband group. There were 215 probands. Of the 215, 100 probands had 194 children between the ages of 6 and 18 years. There were a greater number of children ages 13–18 (63%), reflecting the older age of the probands, but there were nearly equal numbers of male and female children. The mean number of children per proband, about 2, was similar in the two proband groups, as were the age and sex distributions of the children by proband groups.

Any Symptoms, Treatment, or Diagnoses in Children

Table 2 shows that more children of the depressed probands than of the normal probands had symptoms,

TABLE 1

Age and Sex of Children by Proband Group

	Proband Group (*N*)		
	Normal	Depressed	Total
Probands (*N*)	82	133	215
Probands with children <18 (*N*)	40	60	100
Children at risk (*N*)	87	107	194
Ages—Children (%)			
6–12	40	34	37
13–18	60	66	63
Sexes—Children (*N*)			
Male	49	50	49
Female	51	50	51

TABLE 2

Symptoms, Treatment or Diagnoses in Children by Proband Group

	Rates/100 in Children		
	Proband group		Significance of difference
	Normal	Depressed	
Any symptoms or treatment in child	16.1	33.6	$p < 0.01$
Any DSM-III diagnosis in child	8.1	24.2	$p < 0.01$

psychological treatment, and DSM-III diagnoses. The rate of any DSM-III diagnoses among the children of depressed probands was about threefold greater than among the children of normal probands.

Over 25% of the children of depressed probands, compared with 9.2% of the children of normals, received some treatment for an emotional problem (Table 3). There was a range of treatments represented among the children of depressed probands including child guidance clinics (7.5%), school counselors (4.7%), family agencies (4.7%), and pediatricians (7.5%).

These categories are not mutually exclusive, and the children could have received treatment in more than one area. There were 3.7% of the children of the depressed probands and none of the children of normals who received medication for psychiatric problems. Among those having school problems including school failures, the need to repeat a grade, truancy, etc., there were 17.8% of the children of the depressed probands, compared with 6.9% of the children of normals. These categories, also, are not mutually exclusive.

DSM-III Diagnosis in Children

Table 4 shows that a variety of DSM-III diagnoses occur in the children of depressives. Major depression (13.1%), attention deficit disorder (10.3%), and separation anxiety (10.3%) were the most common. These rates are not age corrected. Due to the narrow age range studied and the small sample size we felt that unadjusted rates would be the most straightforward representation. Age adjustments would increase the rates, as will be shown in Table 6.

Table 5 shows that 17.8% of the children of the depressives had more than one diagnosis.

TABLE 3

Type of Treatment and School Problems in Children by Proband Group

	Rates/100 in Children Proband Group	
	Normal	Depressed
Treatment Received by Children for an Emotional Problem:		
Child guidance clinic	0.0	7.5
School counselor	3.5	4.7
Psychiatrist	0.0	4.7
Family agency	0.0	4.7
Pediatrician	4.6	7.5
Other	1.2	7.5
Any of above	9.2	25.2
Medication	0.0	3.7
Special school	1.2	4.7
School Problems of Children:		
Failure or repeat grade	4.6	7.5
Slow learner	1.2	3.7
Truancy	1.2	5.6
Suspended or expelled	1.2	0.9
Any of above	6.9	17.8

TABLE 4

Types of DSM-III Diagnosis in Children by Proband Group

	Rates/100 in Children Proband Group	
	Normal	Depressed
Number of children at risk	87	107
DSM-III Diagnosis in Children[a]		
Major Depression	0.0	13.1
Attention Deficit	1.2	10.3
Separation Anxiety	0.0	10.3
Conduct Disorder	1.2	6.5
Developmental Reading	3.5	4.7
Other Diagnoses	0.0	
Social Phobia	1.2	
Drug Abuse	0.0	3.7
Minor Depression	0.0	2.8
Panic Disorder	0.0	1.9
Agoraphobia	0.0	1.9
Obsessive-Compulsive	1.2	1.0
Alcohol Abuse	0.0	1.9
Simple Phobia	0.0	0.9
Any disorder	8.1	24.3

[a] These are not mutually exclusive. A child can have more than one diagnosis. The rates are not age adjusted.

Age Corrected Rates of Depression by Sex

Age corrected rates of depression by sex for the children of probands were calculated using lifetime

TABLE 5

Number of DSM-III Diagnoses in Children

No. of DSM-III Diagnoses	Rates/100 in Children Proband Group	
	Normal	Depressed
0	91.9	75.7
1	8.1	6.5
2	0.0	4.7
3 or More	0.0	13.1

risk (LTR), which is defined as the risk of onset of a particular disorder between birth and some particular age (age 18 in this case). The estimation of LTR is based on Kaplan and Meier's (1958) nonparametric product-limit table method for analyzing survivorship, which yields a maximum likelihood estimate of LTR. This method makes a calculation at each point in time when there is a change in the number of individuals at risk for developing the disorder. The number at risk changes with each onset of the disorder, and with each death of an unaffected individual (Thompson and Weissman, 1981). The Biomedical Computer Program P-series (BMDP) program PIL was used to calculate LTR (Dixon, 1981).

Caution must be exhibited in interpreting these rates because of the small sample size of children affected and the problem of determining age of onset of disorder from retrospective data. The LTR up to age 18 for developing major depression was 0.23 among the male children of probands, and 0.20 among the female children of probands, indicating no sex differences in risk of major depression.

Figure 1 depicts the cumulative proportion of male and female children affected with major depression. The earliest age of onset of depression was age 6 and there were no significant sex differences in patterns of age of onset.

Suicidal Behavior

Suicidal behavior was reported in the children of depressives but not in the children of normals. In answer to nonmutually exclusive questions, 6.5% of the children of depressives reported suicidal ideas, 5.6% wished they were dead, 4.7% felt the family would be better off if they died, 0.9% threatened suicide, and 0.9% actually made a suicide attempt.

The Effect of Illness in Both Parents

Table 6 presents rates of DSM-III diagnosis of major depression or of any other DSM-III diagnosis in the children for groups defined by the clinical status of the parents. Seventy-four children had both parents ill, 60 children had one parent ill, and 60 children had neither parent ill.

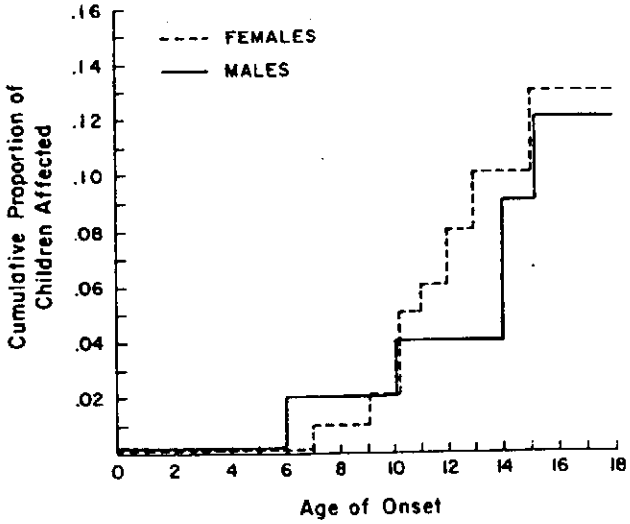

FIG. 1. Risk of major depression in children by age 18.

TABLE 6

DSM-III Diagnosis in Children by Number of Parents Psychiatrically Ill

DSM-III Diagnosis in Children	Rates/100 in Children Psychiatric Illness of Parents		
	Both ill ($N = 74$)	One ill ($N = 60$)	Neither ($N = 60$)
Major Depression	12.2	8.3	0.0
Any Diagnosis	23.0	16.7	10.0
Test for Linear Trend in Proportions			
Major Depression in Children	$p < 0.01$		
Any Diagnosis in Children	$p < 0.01$		

Children with both parents ill had significantly more depression or any DSM-III diagnosis than children with one or no parent ill. Furthermore, the effect was linear in that children with two parents ill were the most affected and children with no parents ill had the least. Major depression (24.3%), substance abuse (13.1%), and anxiety disorders (11.0%) were the most common disorders in the spouse of the proband.

Proband Characteristics as Risk Factors for Illness in Children

Several proband characteristics including sociodemographic variables, early history and family history of illness, etc., were examined to determine whether they increased the risk of major depression or any DSM-III diagnosis in children (Table 7). Those proband characteristics which did not increase the risk were: current age; sex; social class; number of children (any age) in family; childhood history of stuttering, sleep walking, or enuresis; and separation from parent as a child.

The characteristics of probands which did increase

TABLE 7

Proband Characteristics and Rates/100 of DSM-III in Their Children

Proband Characteristics	DSM-III Diagnosis in Children			
	No diagnosis	Major depression	Any other diagnosis	Significance of difference
Age (mean)	41.4	42.9	41.7	NS
Sex:				
Male ($N = 80$)	86.3	6.3	7.5	NS
Female ($N = 114$)	80.7	7.9	11.4	
Social class[a] (mean)	3.5	3.2	3.2	NS
No. offspring (any age) in family (mean)	3.5	3.4	3.8	NS
Childhood history of enuresis, stuttering, or sleepwalking:				
Yes ($N = 47$)	76.6	12.8	10.6	NS
No ($N = 147$)	85.0	5.4	9.5	
Separated from parent as a child:				
Yes ($N = 62$)	85.5	9.7	4.8	NS
No ($N = 132$)	81.8	6.1	12.1	
Age of onset of depression (mean)	27.8	22.7	21.8	$p < 0.05$
No. first degree relatives psychiatrically ill (mean)	2.1	3.9	2.9	$p < 0.01$
No. first degree relatives depressed (mean)	0.6	1.7	0.9	$p < 0.01$
Marital status:				
Currently married ($N = 162$)	85.8	6.2	8.0	$p < 0.01$
Currently widowed/divorced/separated ($N = 32$)	68.7	12.5	18.7	

[a] Based on Hollingshead Two-Factor Index of Social Position (scale range 1–5).

risk in children were: earlier age of onset of depression, increased number of first degree relatives (i.e., probands' parent, siblings or adult children, or children's grandparents, aunts, uncles and adult siblings) depressed or with any psychiatric illness, and marital status (separated, divorced or widowed).

Discussion

In a family study of 194 children (ages 6–18) of probands with depression who were compared with the children of normal controls, preliminary findings showed:

1. Children of depressives are at increased risk for psychological symptoms, treatment for emotional problems, school problems, suicidal behavior, and DSM-III diagnoses. The magnitude of the risk is increased threefold for any DSM-III diagnosis in the children of depressed probands compared with the children of normal probands.

2. Major Depression is the most common psychiatric disorder in children of depressives, followed by attention deficit and separation anxiety. Multiple diagnoses are common.

3. The risk to children of major depression and of any DSM-III diagnosis increased linearly if both parents were psychiatrically ill than if only one or neither parent had psychiatric illness.

4. The proband's current age, sex, social class, number of children, childhood history of stuttering, enuresis, sleepwalking, or separation from parent did not increase the risk of major depression or any DSM-III diagnosis in his/her children.

5. The significant predictors of risk to children were early onset of the proband's depression, an increased number of the proband's first degree relatives who were ill with any psychiatric disorder and/or major depression, and if the proband was divorced, separated or widowed.

These findings are provocative and, in future reports, will be explored more fully according to severity and subtype of parental depression, and by timing the onset of disorders in children. However, the substantive findings of this study should be viewed against its methodologic limitations. Direct interviews with children and teachers' reports are lacking. Because these rates are based on family history, they are probably underestimates (Thompson et al., 1982). In t' of th adult first de ree relatives of these p the rates in interviewed relatives were twice that of relatives for whom information was only available by family history (Weissman et al., 1982). Detailed assessment of children's social functioning, personality, and social supports which may contribute to outcome are lacking. On the other hand, the best estimates of DSM-III diagnoses were based on information from multiple sources and were made by a diagnostician blind to the clinical status of both parents. With the exception of the study of 226 children by Welner et al. (1977) this is, to our knowledge, the largest sample of children of affectively ill parents reported thus far.

While the study of the children of psychiatrically ill patients has a long history (Rutter, 1966), the specific focus on affective illness is considerably more recent, i.e., the excellent critical review by Beardslee et al. (1983) and by Orvaschel (1982). Beardslee et al. reviewed 24 quantitative studies of children who were

at risk for affective disorder because of having a parent with an affective illness. A number of the studies included the children of affectively disordered parents who were comparison groups for the children of schizophrenics. These studies did not differentiate results in children by whether the parent was bipolar or unipolar. They did not include retrospective accounts about childhood from adults with affective disorders. In general, they found that children having parents with a major affective disorder were at significant risk and were considerably impaired. However, methodologic problems such as the limited number of children studied, the diagnostic variability, the lack of blindness of diagnosis, and the absence of controls, restricted the conclusions about the degree of risk for affective illness in the children, or the range of risk factors.

Orvaschel's review included only those studies focusing primarily on children of affectively disordered parents. Six previously published studies of children of affectively ill parents were evaluated. Four of the six studies included unipolar probands (Conners et al., 1979; Greenhill et al., 1980; McKnew et al., 1979; Welner et al., 1977). One study included both bipolar and unipolar probands but did not make a division of the results for the children by diagnosis in proband (Cytryn et al., 1982). Three of the six studies included non-ill controls (Cytryn et al., 1982; Robins et al., 1977; Welner et al., 1977). The Orvaschel (1982) conclusions, however, were similar to those of Beardslee et al. (1983) with regard to the children and to the methodologic limitations of the studies. Subsequent to the Orvaschel have been a clinical overview of children at risk for affective illness (Kestenbaum, 1982) and a study of 31 children of manic depressive parents (Kron et al., 1982).

Because of the differing methodologies among published studies it is difficult to compare absolute rates of disorders in children. However, as we have shown in the study of the adult first degree relatives of these probands, there is considerable variability in rates (Weissman et al., 1982). The rates vary by diagnostic criteria, age adjustments, and the diagnostic hierarchies used, as well as the number of relatives interviewed, etc. Therefore, what is important to compare between studies is the direction of the results. In this regard, all published studies found, as did ours, high rates of depression and other problems in the children of depressives when compared to the children of non-ill controls.

While this study has focused on children at risk for affective illness by virtue of having an affectively ill parent, a related and important group of studies has also emerged which begins with children already affectively ill and examines predictors of their illness, including parental illness. Among these, the Strober and Carlson (1982a, b) study of sixty 13–16-year-old adolescents hospitalized for major depression is the most comprehensive. Their study showed a high loading of affective disorder, particularly bipolar illness, in the pedigrees, and presence of illness in three successive generations. The unusually early age of onset of illness in these children may account for the heavily loaded family histories.

Several findings in our study deserve to be highlighted. In agreement now with an increasing number of investigators (Orvaschel et al., 1981; Puig-Antich, 1980) we found that prepubertal depression did occur, and, like Cytryn et al. (1982), we found no effect of sex of child on rates of childhood depression. However, larger samples with direct interviews of children are necessary before any definitive conclusions can be drawn.

A particularly important finding is the increased risk of illness among children with two parents who are ill. Only Cytryn et al. (1982) found no increased effect on offspring having two affectively ill parents. Fischer and Gottesman (1980), in their review of 8 dual mating studies, found a considerable effect. For affective psychoses, the age-corrected incidence of the same disorder in the offspring when one parent has an affective psychosis is around 20%, and around 50% if both parents have an affective psychosis.

Again, because of the between-study differences in the diagnostic criteria used, the age of the offspring samples, and the method of age correction, no comparison of absolute rates can be made. However, the direction of the results, a linear relationship between rates in offspring and number of parents who are ill, is similar among most studies. Moreover, in our analysis of the rates of major depression among the adult offspring in this study we found the same increased risk to offspring with both parents affected.

The increased illness in the proband's parents, siblings, and adult children, as well as lack of intact family and early onset of the proband's depression, were also factors which increased the risk in children. These findings can be interpreted as being related to familial genetic loading and/or to the impact of environmental factors. The implication of these findings for understanding gene-environment interactions will be examined on the basis of the data reported here, and the more comprehensive data we are now collecting through the direct interviewing of these children.

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