THE AMERICAN JOURNAL OF PSYCHIATRY

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A Prospective Study of Delinquency in 110 Adolescent Boys with Attention Deficit Disorder and 88 Normal Adolescent Boys

BY JAMES H. SATTERFIELD, M.D., CHRISTIANE M. HOPPE, PH.D., AND ANNE M. SCHELL, PH.D.

The authors studied official arrests from childhood through adolescence in two groups of boys; one group (N=110) was diagnosed in childhood as suffering from attention deficit disorder (ADD), and the second group (N=88) consisted of normal control adolescents. Rates of single and multiple serious offenses and of institutionalization for delinquency were significantly higher in the ADD subjects. These findings suggest a strong relationship between childhood ADD and later arrests for delinquent behavior.

The present study is part of an extensive follow-up of children with attention deficit disorder (ADD) who have been studied from childhood through adolescence. The ADD group was diagnosed in childhood as suffering from attention deficit disorder with hyperactivity. Since the two groups were selected to include only boys, and the ADD group had a significantly higher rate of institutionalization for delinquency, the results may not be applicable to adolescent girls with ADD.

METHOD

The present study is part of an extensive follow-up of 110 ADD and 88 normal control subjects, full details of which will be reported elsewhere (unpublished data). Informed consent was obtained from all subjects and from their parents after the procedures were fully explained to them. All children in the clinical group were originally referred between 1976 and 1979 for learning and/or behavioral problems to an outpatient clinic for hyperactive children. Most referrals came from schools, parents, and pediatricians. No child was referred by the courts. To be selected for the clinical group a child had to be male, between the ages of 6 and 12 years, attending school, tested as having normal vision and hearing, and at or above 80 in IQ according to the Wechsler Intelligence Scale for Children (WISC full scale). And, diagnosed by a child psychiatrist using behavioral criteria that required evidence of a long-term (6 months or longer) symptom pattern of hyperactivity, inattention, and impulsivity as reported by parents and/or teachers. Normal control children were paid subjects selected from public school classes and were matched to the clinical group for age, sex, race, and, as closely as possible, for WISC full scale IQ.

The Satterfield Teacher Rating Scale and the Satterfield Parent Rating Scale were administered to most subjects. The rating scale for teachers consisted of 36 items concerning classroom behavior arranged in a checklist form so that the teacher could indicate the degree to which each item of behavior was exhibited (0=not at all, 1=just a little, 2=pretty much, 3=very much). These scales have been demonstrated to have high test-retest reliability and to validly differentiate placebo from methylphenidate treatment groups (15).

The Satterfield Parent Scale consists of 45 behavioral items rated on a 3-point scale in a manner similar to that of the Teacher Rating Scale. When subjects were selected for this study the diagnostic category of attention deficit disorder was not in use. Nevertheless, the clinical children in this study were selected by criteria that are similar to DSM-III criteria for attention deficit disorder with hyperactivity. Since the two groups were selected according to behavioral criteria, it is not surprising that their scores differed significantly on nearly all 36 items of the Teacher Rating Scale when t-tests were done (see table 1).

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This study focuses on the relationship between childhood ADD and teenage offender rates (number of subjects arrested) rather than offense rates (number of arrests).
add group and 97% of the controls) were white. From lower socioeconomic class families living in Los Angeles County. We therefore included in this study only subjects who had been living in the county for the 8-year interval covered by our follow-up study. This selection resulted in 110 ADD and 75 control subjects. In order to improve the socioeconomic class balance between groups we added the control group at follow-up of all non-ADD brothers of subjects who were aged 14-20 years and were therefore lower socioeconomic class families living in Los Angeles County. This provided us with an additional control group of 62 ADD and 88 control subjects. The majority of the subjects (83% of the ADD group and 97% of the controls) were white. Official arrest information was obtained on 198 subjects. At follow-up we classified offenses into two types—serious and nonserious. Nonserious offenses included running away from home, alcohol intoxication, possession of less than an ounce of marijuana, vandalism, and petty theft. Serious crimes included robbery, burglary, grand theft, grand theft automobile, and assault with a deadly weapon. Only the arrest data for serious offenses are reported here. The socioeconomic status of all families was based on the 6-point Duncan Scale (5). Due to the small cell sizes, this score collapsed into a 3-point scale by combining adjoining categories. All analyses of comparisons on outcome data between the ADD and control groups and between subgroups of ADD subjects were performed using the chi-square test or Fisher's exact probability test (two-tailed). For socioeconomic status and age, the person doing the subgroup of 63 ADD and 63 control subjects matched with 1 subject in the control group (1%) by race, sex, age, and SES group (df=1, p<.001). ADD youths were placed in five types of institutions (table 2); three of these (juvenile hall, state and county probation camps, and prison or jail) were locked facilities. Institutionalization patterns varied from youths who had been placed in only one type of institution to youths who had been placed in several different institutions. There was a nonsignificant trend toward lower institutionalization rates in the higher socioeconomic status groups. To avoid confounding the effects of socioeconomic status and institutionalization rates we selected a matched sample of 63 ADD and 63 control subjects matched for socioeconomic status and age. The person doing the matching was blind to the subjects' arrest records. We then compared institutionalization rates between groups in these matched subgroups and found that 29% of the ADD group and 46% of the normal group had been institutionalized (x2=13.2, df=1, p<.001). Length of psychopharmacotherapy was not related to outcome.

The poor outcome for drug-treated ADD children that we found in this study is consistent with the results of several follow-up studies of drug-treated children that have found an absence of long-term benefit for drug treatment (6). However, the long-term benefits of drug treatment have not yet been demonstrated. An important question for physicians to consider is whether stimulant medication alone results in any long-term benefit for ADD? This question is important because the child is receiving the medication that might prevent their progress.
DELINQUENCY IN BOYS WITH ATTENTION DEFICIT DISORDER

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tion from the need for treatment aimed at other associated disabilities such as poor peer relationships, poor self-image, antisocial behavior, and learning disabilities (6).

The strong relationship between juvenile delinquency and adult arrest (7, 10) suggests that a sizable number of our ADD delinquents will become adult offenders. These findings have implication for prevention of juvenile delinquency and adult criminality. It is well known that delinquent and criminal behavior usually originates in early childhood and that antisocial behavior, once firmly established, is notoriously resistant to treatment (reference 11 and unpublished data from S.H. Shamsie, 1980). A recently developed multimodality treatment program for ADD children may offer new hope for aborting antisocial behavior and preventing later delinquency and criminality. One component of this program involved specific treatment of antisocial behaviors and underlying psychopathology. ADD children in this program were found to have less antisocial behavior, enhanced academic performance, and better social adjustment when evaluated after 1, 2, and 3 years of multimodality treatment (6, 12). From the viewpoint of cost effectiveness, it is far less expensive to fund such treatment programs for ADD children than to attempt to deal with the problems of delinquency and criminality within the criminal justice system. For example, the cost of 1 year of the multimodality treatment program for a child with ADD is approximately $2,000 (12), which is 10% of the cost of 1 year’s incarceration in juvenile hall. Social and fiscal loss to society for those who become adult offenders cannot be accurately estimated. We hope that this study will contribute to a greater focus of scientific and social attention on children who are at high risk for the development of delinquency and to a greater emphasis on early intervention and treatment.

REFERENCES
