

# Stimulant and Psychosocial Treatment of ADHD in Latino/Hispanic Children

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## ABSTRACT

**Objective:** To examine to what extent Latino/Hispanic children with and without attention-deficit/hyperactivity disorder (ADHD) are receiving treatment and to identify variables that predict treatment with stimulant medication. **Method:** Primary caretakers of a probability household sample ( $N = 1,897$ ) of Puerto Rican children aged 4–17 years were administered structured interviews (response rate: 90.1%) from 1999–2000 to ascertain psychiatric disorders and types of services received. **Results:** Only 7.0% of children with ADHD received stimulant medication during the last year; moreover, only 3.6% had actually continued this treatment at the time of the interview. One fourth or less of those with ADHD received school-based services or psychosocial treatment. The male-female ratio in stimulant medication use was 10 to 1. In addition, only 0.2% of those with no psychiatric diagnosis received this treatment. ADHD and ADHD-not otherwise specified, impairment, and being male significantly predicted stimulant treatment. **Conclusions:** Children with ADHD in this Latino/Hispanic population are not receiving the most efficacious treatments based on scientific findings and relevant clinical consensus. This population is undertreated rather than overtreated. *J. Am. Acad. Child Adolesc. Psychiatry*, 2003, 42(7):851–855.

**Key Words:** attention-deficit/hyperactivity disorder, treatment, Latino/Hispanic, gender.

Individuals with attention-deficit/hyperactivity disorder (ADHD) are not receiving pharmacological and psychosocial treatment, especially those in ethnic minority groups, particularly Latino/Hispanic (Jensen et al., 1999). On the other hand, inappropriate rises in the rate of medication treatment have been reported (e.g., Jensen et al., 2003). Recent studies comparing the prevalence of stimulant treatment for ADHD with the prevalence of the

disorder in population-based samples have produced contradictory results. Some studies have found that medication is not overprescribed in children with ADHD (Barbaresi et al., 2002; Jensen et al., 1999; Rowland et al., 2002), while others have reported overprescription (Angold et al., 2000). The discrepancies observed in these studies might be in part due to the result of methodological factors such as differences in assessment instruments and sample characteristics (Jensen, 2000; Safer and Zito, 1999). Therefore, to understand fully the use of medication treatment for ADHD, not only should the prevalence of medication treatment be studied, but also possible factors related to its utilization must be identified (Jensen et al., 2003; Safer and Zito, 1999).

The present study examines the following issues in a population of Latino/Hispanic (Puerto Rican) children: (1) to what extent children with ADHD are receiving medication and psychosocial treatments; (2) to what extent children with no ADHD diagnosis are being treated with stimulants; and (3) which variables predict stimulant treatment in this population. To our knowledge, this is the only study of its kind using *DSM-IV* research criteria for ADHD in a large nonreferred community sample of children aged 4–17 years.

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## METHOD

### Participants

Children 4–17 years old were selected from an island-wide probability household sample. A multiple-stage sampling strategy was used, with the U.S. 1990 Census block groups as primary sampling units, stratified by urban/rural and health reform regions. Clusters of households were randomly selected from each strata, followed by selection of households with children between ages 4 and 17, one child within each household using Kish tables (1965) adjusted for age and gender. This strategy yielded interviews with 1,890 children and 1,897 primary caretakers (mostly biological mothers) and 1,886 parent–child dyads (response rate of 90.1%).

### Instruments and Measures

*Demographic and Psychosocial Assessment Battery.* This computer-assisted assessment battery covered, among other factors, demographic variables, risk and protective factors, medical insurance coverage, and attitudes toward medication use.

*Diagnostic Interview Schedule for Children Version IV. DSM-IV* psychiatric disorders were assessed using the latest translation into Spanish of this computerized structured instrument, the Diagnostic Interview Schedule for Children Version IV (DISC-IV), designed to be administered by lay interviewers (Bravo et al., 2001). In this study, parental reports are used, given data that parents (versus youth) are more reliable informants for ascertaining the presence of ADHD (Bravo et al., 2001). Teacher information was not assessed. Thus, whenever we refer in this article to ADHD, we mean parent-reported ADHD. The DISC-IV scoring algorithms did not include exclusionary criteria (criteria E) but included impairment and distress associated with each diagnosis (criteria D). Probes assessed the degree to which symptoms have affected the youth's relations with his/her caretaker, family, friends, or teachers or have affected the youth's school functioning. The test-retest reliability of the Spanish DISC-IV showed fair to moderate agreement for previous-year parent reports on most diagnoses. For ADHD, the reliability ( $\kappa$ ) was 0.49 (Bravo et al., 2001).

*Service Assessment for Children and Adolescents.* The Spanish parent-version of the Service Assessment for Children and Adolescents (Canino et al., 2002) was used to ascertain lifetime and last-year use of various types of services and treatments (25 specific service settings) by children for emotional, alcohol, and drug problems. It has shown fair to moderate reliability for most services as well as substantial test-retest reliability for last-year use of any psychoactive medication and number of medications; poor or no agreement was observed for dosage (Canino et al., 2002).

*Parent Lay Interviewer Children's Global Assessment Scale.* The Parent Lay Interviewer Children's Global Assessment Scale (PICGAS) is scored by lay interviewers and yields a global measure of the child's impairment on adaptive functioning at home, community, school, and with friends (Bird et al., 1996). The Spanish translation of the PICGAS has been shown to be moderately reliable (test-retest, intraclass correlation coefficient = 0.69). The concurrent, discriminant, and construct validity of the instrument have also been reported (Bird et al., 1996) using combined data from four communities (including Puerto Rico).

### Procedures

The survey was carried out in 1999–2000, following approval of the study protocol by the university's institutional review board. Assent was obtained for children aged 6–10 years and informed consent was obtained from the adult informant and children aged 11–17 years.

Interviews took place in the subject's home and were conducted by different interviewers for the parent and child, blind to the results of the other's interview. Interviews were audiotaped, and 15% were spot-checked at random for quality-control purposes.

### Analytic Strategy

The sample was weighted to represent the population of children aged 4–17 in Puerto Rico in the year 2000 based on the probability of selection for each child into the sample. For the initial set of analyses four groups were constructed: (1) Children who met DISC-IV ADHD criteria. (2) Children who did not meet ADHD criteria (ADHD-not otherwise specified [NOS]), operationalized as follows: (a) children who met criterion A (six or more symptoms of inattention or hyperactivity-impulsivity), criterion B (age of onset before 7 years), and criterion C (presence of symptoms in two settings); (b) children who met criterion A and either B or C; and (c) children who met criteria B and C but not A, and instead had four or five symptoms of inattention or hyperactivity-impulsivity. None of the ADHD-NOS subgroups met criterion D (impairment). (3) Children who met criteria for psychiatric disorders other than ADHD or ADHD-NOS. (4) Children who did not meet criteria for any disorder.

The ADHD-NOS group was created to examine to what extent children with prominent symptoms of inattention or hyperactivity-impulsivity were receiving stimulant medication. Logistic regression models were constructed to include predictors of stimulant use. ADHD, global impairment (PICGAS cutoff score of 68), ADHD-NOS, and gender were the variables selected on the basis of the reviewed literature. SUDDAN software (release 8.0) was used to estimate all logistic regression models, and models were estimated with Taylor linearization methods with robust standard errors (Binder, 1983).

## RESULTS

### Demographic Characteristics

The sample included a higher proportion of children aged 4–10 years and males (Table 1). Most primary caretakers had a high school degree, were married, and had a household income less than \$25,000.

### Treatment of ADHD

Table 2 presents the number and weighted percentages of children in the four groups that received medication and psychosocial services during the preceding year. As can be seen, the prevalence of stimulant medication treatment for the ADHD and ADHD-NOS groups was 7.0% and 3.3%, respectively. None of the children in the “other DISC-IV diagnosis” group and 0.2% of the “no DISC-IV diagnosis” group received stimulant treatment.

Of the 11 children in the ADHD group receiving stimulant medication in the preceding year, 1 was also receiving other medications (another stimulant and an antipsychotic). One medicated child in the ADHD group that did not receive stimulants received an antipsychotic.

**TABLE 1**Demographic Characteristics of Children Aged 4–17 Years and Their Caretakers in Puerto Rico (Weighted Data,  $N = 1,897$ )

Characteristics	<i>n</i>	Weighted %
Gender		Children
Male	982	51.1
Female	915	48.9
Age		
4–10	986	50.2
11–17	911	49.8
Education		Primary Caretakers
Less than HS	542	31.3
HS degree	760	40.4
Some university	558	28.4
Civil status		
Married	1,106	57.4
Nonmarried	786	42.6
Household income		
<12,000	702	40.7
12,001–25,000	603	33.4
>25,001	480	25.8

Note: Numbers do not add to 1,897 due to missing values. HS = high school.

Only 3.6% who met ADHD diagnostic criteria and were medicated with stimulants in the previous year had continued this treatment at the time of the interview. Reasons given for discontinuation were negative side effects ( $n = 2$ ), lack of effectiveness ( $n = 1$ ), and parental disagreement ( $n = 1$ ). The health insurance of these children cov-

ered totally ( $n = 3$ ) or partially ( $n = 1$ ) medication costs. Finally, additional analyses of the children with ADHD who were also globally impaired indicated that only 12.7% of them received stimulant treatment last year.

Fewer than one fourth of the children with ADHD received child and family therapy, case management, and evaluation/testing services in mental health facilities or by mental health professionals. Approximately one fourth of children with ADHD received some type of school-based psychosocial service or outpatient service during the preceding year. In addition, of those with ADHD who received residential hospitalization and out-of-home placement services (3.7%), one was hospitalized, another was in a substitute home placement, and two were in a juvenile detention center.

In brief, only about 40% (45 boys and 10 girls) received any services and 7.0% (10 boys and 1 girl) received stimulant treatment during the preceding year. All but 2 of the 11 children in the ADHD group that received stimulant medication also received psychosocial treatments, but only about half ( $n = 5$ ) received school-based services. The ADHD-NOS and “other DISC-IV diagnosis” group received fewer psychosocial services than the ADHD group.

To identify variables associated with psychostimulant prescription, six groups were compared on demographic and clinical characteristics: children with ADHD and ADHD-NOS receiving or not receiving stimulants, and

**TABLE 2**Children Aged 4–17 Years Receiving Medication and Psychosocial Services During the Last Year by Diagnostic Groups (Weighted Data,  $N = 1,897$ )

Treatment and Services	ADHD ( $n = 143$ )			ADHD-NOS ( $n = 151$ )			Other DISC-IV Dx ( $n = 73$ )			No DISC-IV Dx ( $n = 1,519$ )		
	<i>n</i>	%	SE	<i>n</i>	%	SE	<i>n</i>	%	SE	<i>n</i>	%	SE
Psychotropic treatment												
Any medication	12	7.2	2.2	7	5.3	2.2	2	1.5	1.1	8	0.4	0.2
Stimulants	11	7.0	2.2	5	3.3	1.6	—	—	—	6	0.2	0.1
Psychosocial treatment												
Child therapy	31	23.4	4.9	15	10.0	2.8	4	6.6	3.2	38	2.5	0.5
Case management	20	13.7	4.0	7	4.7	2.0	2	2.8	2.1	25	1.4	0.4
Evaluation/testing	26	17.6	4.0	11	5.4	1.7	1	2.5	2.3	32	1.9	0.4
Family therapy	22	16.2	3.5	13	8.7	2.6	3	5.3	3.0	36	2.3	0.4
Context of services												
Any school-based	35	26.5	4.8	30	18.6	4.1	6	12.2	6.1	89	6.1	0.9
Any outpatient	35	25.8	5.0	23	14.3	3.4	6	9.4	3.7	59	3.6	0.6
Any hospitalization/residential	4	3.7	2.4	—	—	—	—	—	—	4	0.3	0.2
Any service use	55	40.4	5.3	41	25.4	4.7	11	20.9	8.2	133	9.0	1.1

Note: Numbers do not add to 1,897 due to missing values. ADHD = attention-deficit/hyperactivity disorder; NOS = not otherwise specified; DISC-IV = Diagnostic Interview Schedule for Children Version IV. Diagnostic categories were created in a hierarchical order as presented above with ADHD being the highest-ranking rate.

children without ADHD or ADHD-NOS receiving or not receiving stimulants. All but 1 of the 11 children with ADHD who received stimulant treatment were males, 1 was 17 years old, and the others were from 5 to 11 years old.

Important trends are suggested by inspection of the data (available from the authors upon request). In general, the stimulant-medicated ADHD and ADHD-NOS groups present a similar number of ADHD symptoms but more so than their nonmedicated counterparts. In addition, most children in the stimulant-medicated ADHD and ADHD-NOS groups were globally impaired, i.e., with a PICGAS score < 69. Finally, the stimulant-treated ADHD and ADHD-NOS groups included more males, more comorbid diagnoses, higher household income, and more positive attitudes toward the use of medication than the other groups. Most participants had health insurance coverage.

Our first logistic regression model, model A, included four predictor variables: ADHD diagnosis, global impairment in adaptive functioning, male gender, and ADHD-NOS diagnosis. The overall model was highly significant (Wald  $F = 49.9$ ;  $p < .001$ ), as was each of the predictor variables. Holding all other variables constant, having an ADHD and ADHD-NOS diagnosis, impairment in functioning, and male sex were associated with higher odds of receiving stimulant medication during the previous year. Although the effect of our predictor variables is highly significant, estimates of the magnitude of these effects are not precise because of the low prevalence of stimulant medication in our sample. Because of the similarity of effects of ADHD and ADHD-NOS diagnoses, both variables were combined as a single predictor and a revised model with only three predictor variables was estimated, model B. In this case, similar results as in model A were obtained: ADHD/ADHD-NOS (odds ratio [OR] = 12.1, 95% confidence interval [CI] = 4.8–30.2; Wald  $F = 28.8$ ;  $p < .001$ ), impairment (OR = 6.8, 95% CI = 2.6–18.1; Wald  $F = 15.0$ ;  $p < .001$ ), and being male (OR = 8.9, 95% CI = 1.9–41.1; Wald  $F = 8.0$ ;  $p < .001$ ) were associated with higher odds of receiving stimulant medication during the preceding year (overall Wald  $F = 61.9$ ;  $p < .001$ ).

Other variables were considered for inclusion in the model, but none were identified as significant predictors of stimulant use: (1) household income (dichotomous variable using a threshold of \$25,000); (2) insurance coverage during the last year; and (3) comorbidity (number of additional DISC diagnoses). Age (membership in the 6–11 age group) and positive attitudes toward medication were not evaluated due to extremely low  $n$ 's.

## DISCUSSION

Our data support Jensen and colleagues' (1999) findings that most children with parent-reported ADHD in the community are undertreated and that stimulant medication is not necessarily overused. Moreover, findings from the logistic regression analyses that ADHD, ADHD-NOS, and global impairment predicted last-year stimulant treatment suggest that clinicians are using clinically significant criteria for prescribing this type of medication.

On the other hand, only a small number of children with ADHD with or without additional global impairment were receiving medication treatment. The extremely low prevalence of medication in this community sample is of concern given that this treatment modality has been amply demonstrated to reduce the core symptoms of the disorder and associated behavioral difficulties (MTA Cooperative Group, 1999). Socioeconomic and insurance barriers do not appear to explain these findings, as household income was not predictive of medication and the great majority of the participants had insurance coverage.

A comprehensive treatment of ADHD includes the provision of psychosocial services (American Academy of Child and Adolescent Psychiatry [AACAP], 1997). However, only roughly one fourth of children with this diagnosis in this study received school-based services (counseling, special help, or education). Furthermore, of those treated with stimulant medication, only half were receiving these services. It is worrisome that such a low percentage of children received any school-based services, not only because the latter are an integral part of treatment for ADHD, but also because there is a legal mandate to provide them (Public Law 94-142). Also of concern is that only one fourth of children received mental health outpatient services given that more than half of the children with ADHD presented with comorbid oppositional defiant and conduct disorders and a third met criteria for depressive or anxiety disorders.

Concerning specialty mental health treatments, fewer than one fourth of the children received psychosocial services, likely needed to treat comorbid disorders, to counsel parents, and/or to facilitate medical treatment adherence and consistent implementation of behavior management techniques (AACAP, 1997). This finding is especially troubling, given the persistence of ADHD and the likely requirement for treatment across the life span (Barkley, 1998).

Consistent with other studies, being male significantly predicted stimulant treatment (e.g., Angold et al., 2000).

Importantly, whereas the male-to-female ratio in the prevalence of parent-reported ADHD in our study was 2:1, the corresponding ratio in the prevalence of stimulant medication was 10:1. It is noteworthy that only one adolescent was medicated, suggesting that adolescents with ADHD, in addition to females, are significantly undertreated in this Latino population. Further research is needed to clarify these issues.

#### Limitations

There are several limitations to this study that should be kept in mind. First, no information on the children's behavior was gathered from their teachers. Second, the findings from the present study may not be generalizable to other Latino/Hispanic groups, since our study includes only Puerto Ricans on the island. Third, additional data could have shed more light on the relevance, appropriateness and quality of the treatments offered, and adequacy of the medication dosage used.

#### Clinical Implications

Heightened awareness of the needs of children with ADHD is essential in order to close the gap between evidence-based services required by these Latino children and the services that many of them actually receive. In addition, greater attention to the importance of educating parents about these children's treatment needs appears essential. Also, further research is needed concerning the sociocultural factors that influence treatment-seeking and adherence and the best means to communicate the relevance and importance of these treatments to parents of children with ADHD. While we must certainly be aware of the possibility of "overprescribing," these findings suggest that underprescribing is a much more widespread

problem among children with ADHD in Puerto Rico, even among those who are evidencing substantial impairment in addition to their ADHD symptoms.

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