A 24-Month Follow-up to the NIMH MTA Study

Our MTA group continued to monitor—though not treat—the children and families who participated in the initial study. At 24 months, we evaluated the outcome.



by 13 Members of the MTA Steering Committee

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OVER THE LAST FOUR YEARS the National Institute of Mental Health (NIMH) Multimodal Treatment study of Children with AD/HD—or MTA for short—has received a great deal of attention in scientific literature and the mainstream press. One of the largest treatment studies ever funded by the NIMH for either children or adults, the MTA brought together nationally recognized authorities in AD/HD at six different universities and medical centers to evaluate the leading treatments for AD/HD, including behavior therapy and medication, over a longer time period than is usually studied. As members of the Steering Committee of the MTA for NIMH, we are pleased to provide an overview of the initial results, along with a preview of new findings observed at the 24-month follow up assessment.

Background

The MTA study included 579 elementary school children with AD/HD, ages seven to nine, randomly assigned to one of four treatment conditions implemented over a 14-month period:

 medication alone (medication was carefully adjusted for maximum benefit for each child, with monthly visits with the doctor to check on the child's progress);

 psychosocial/behavioral treatment alone (including an integrated program of specific intervention with the children and extensive training on this approach for parents and teachers);

a combination of both; or

• routine community care (that is, whatever treatments were accessible to families in their community setting).

The study was designed to answer three critical questions:

I. What treatments work best while they are implemented?

2. Which treatments are best in the long term?

3. Are the intensive treatments offered in the MTA research protocol better than the treatment options accessible in the community (often limited by obstacles in the "real world" such as lack of insurance coverage)?

We assessed outcomes in several different domains: the symptoms of AD/HD, aggressive behaviors, anxious/depressed behaviors, parent-child relations, peer and social skills and academic achievement.

Review of Initial Findings (I4 months)

At the end of 14 months, children in *all* treatment groups tended to improve (all were treated; there was

no untreated control group). However, there were significant differences in outcome among the groups and treatment approaches. The initial results, published in December 1999, showed that long-term combination treatments as well as medication management alone were both significantly superior to intensive behavioral treatment alone and/or routine community treatments in reducing AD/HD symptoms. Most (two-thirds) of the group assigned to the community care group received the same type of medication (stimulants) prescribed by the MTA staff, but the way the medication was managed differed, with monthly office visits providing frequent contact between the MTA physicians and families and monthly telephone contact with teachers. The communitytreatment physician, by contrast, generally saw the child only one to two times per year, and for shorter periods of time each visit and usually did not have any direct interaction with the teachers. Perhaps the most significant difference was that the community physicians prescribed lower doses of medication.

Based on these findings, we concluded that for AD/HD symptoms, a closely monitored medication management approach of the MTA was superior to behavioral treatment alone and to routine community care that included medication. Combined treatment offered slightly greater benefits than medication management alone for AD/HD symptom reduction as well as for other domains, such as peer relations, parent-child relations and academic outcomes. The combination treatment was significantly better than medication alone for a global outcome measure that included all six outcome areas noted above, achieving this effect with 20% lower doses than that required for the medication-only group. For some children, particularly those who also had parentreported anxiety problems and additional behavior problems, the combined treatment worked relatively better than the medication or behavior therapy alone. It also aided the social skills of the most economically disadvantaged children in the study more than did the other treatments.



While findings at the 14-month stage were significant, several key questions remained with respect to the lasting benefits of the interventions after the MTAdelivered treatments had stopped, and all families were faced with the challenges and decisions of pursuing care as normally offered in the community.

- Would the initial treatment effects found at 14 months continue, even after the intensive MTA-type treatments were stopped?
- Would the greater effectiveness of intensive medication treatment over behavior therapy continue, or would behavior therapy eventually "catch up?"

• Would the child's having received the earlier combination of medication and behavior therapy prove to be better than having received medication alone?

Ongoing Follow-up Findings

To address these questions, the MTA group continued to monitor—though not treat all children and families who participated in the initial 14-month treatment phase. At 24 months, we evaluated the children's outcomes based on their initially assigned groups, generally finding that outcomes for the combined and medication management groups were superior to the behavior therapy and community-care groups. While the relative superiority was reduced by 50 percent, children who had received the MTA medication alone approach were still better off than children who received the intensive behavior therapy alone (at home and at school). This was particularly true for AD/HD symptoms and oppositional/aggressive symptoms based on ratings by teachers (who were not part of the initial treatment component of the study) as well as by parents. Based on this, we concluded that the benefits of intensive medication management for AD/HD extended 10 months beyond the intensive treatment phase, although the effects appeared to diminish over time.

We also conducted analyses of potential side effects, especially those related to height and weight, areas that have been a concern to parents for decades. Previous studies have *suggested* that such effects—that is, medication-related reductions in height and weight growth rates—are short-term, but disappear by the time the child has become an adult. We did find at both the 14- and 24month assessment points that height and weight were affected. The following letter, sent this fall to all parents of children in the



Combined treatment offered slightly greater benefits than medication management alone, particularly for non-AD/HD-symptom areas, such as peer relations, parent-child relations and academic outcomes.

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MTA study, addressed this issue upfront.

For many years, there have been concerns about the effects of stimulant medication on growth. Some initial studies suggested that growth was reduced by stimulant medication in the short-term, but not in the long-term. To measure these effects in the MTA follow-up, at each assessment we have measured the children's heights and weights to look for any growth suppression in the short run (first year), the "middle run" (second year), and the long run (third year and beyond).

One way that we did this was to compare a group of the children in the MTA who used medication consistently over the two years (the continuously medicated group) to a group of the children who never used medication (the never medicated group). We found that the continuously medicated group grew more slowly than the never medicated group—about 0.75 inch (¾ of an inch) less in height (an increase of 4.10 inches vs. 4.85 inches) and 8.5 pounds less in weight (an increase of 13.5 lbs. versus 22.0 lbs. in weight) over those two years.

We also compared the growth rates of children in the study to national norms. The never medicated group grew faster than the national average (about ½ inch more than expected), whereas the continuously medicated group grew slightly slower than the national average (about ¼ inch less than expected) over the two-year period.

We are now working to find out whether the growth patterns we have shown for the "middle run" (two years) will continue over a longer time period (three years or more). We do not have such information ready right now, but we will let you know when we have some definite findings to report about this important question.

If your adolescent is taking stimulant medication, we suggest that you share this letter with the physician prescribing the medication and ask him or her to read the articles when they appear in Pediatrics (in press, to be published April, 2004). Along with a regular tracking of height and weight, this may help in the regular evaluation of what is the best treatment plan for your adolescent.

The use of medication is an individual decision best made by each family in consultation with the child's doctor. Even though medication appears to incur some risks in terms of slowing growth in height and weight, **continued on page 46** available evidence indicates that the symptoms of untreated AD/HD also pose other risks that have been documented in followup studies of AD/HD, including increased chance of school failure, poor peer interactions, problems with substance abuse, juvenile delinquency, car accidents, etc.

Parents and caregivers have to consider the tradeoffs in the face of uncertainties the uncertainty of not knowing "for sure" whether there are (or the magnitude of) long-term effects on height and weight and the uncertainty of whether stopping an effective medication treatment will result in the return of or increase in a child's difficulties.

Although the children who received medication demonstrated reduced symptoms of AD/HD, they also experienced some effects on weight and height (with height effects ranging from 1/4 to 3/4 inch at the 24month assessment, depending upon the comparison group used to estimate this effect). Of note, some AD/HD investigators have suggested that such growth suppression effects are seen mainly only after a child first starts medication, after which more normal growth rates resume, but the MTA study showed that these effects are manifested at least into the second year of treatment. We cannot yet predict with certainty whether such effects will persist past that point, but because we are following these children into adolescence and young adulthood, our future reports should provide more definitive information on the issue of whether there are persisting effects on longterm growth outcomes.

Disclaimer: The opinions contained in this article are the private views of the authors and are not to be construed as official or as reflecting the views of the National Institute of Mental Health, the National Institutes of Health, or the Department of Health and Human Services.

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