

What the Multimodal Treatment Study Really Discovered About Intervention for Children Diagnosed With ADHD: Implications for Early Childhood

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Attention deficit hyperactivity disorder (ADHD) has risen as the most frequently used diagnosis for children whose behavior or educational performance places them at risk. This paper reviews the Multimodal Treatment Study for ADHD (the MTA study) with a focus on the intriguing results of the Summer Treatment Program (STP) component of the MTA study. Review of the findings of the MTA study in relation to behavioral interventions used in the study and the combination of behavioral interventions and educational approaches used during the STP provides an insight into effective non-drug-based approaches to assist children diagnosed as ADHD. There is an increasing trend towards identifying children with ADHD symptoms in the early childhood period. This review of research indicates that focusing on behavioral, parental, and educational interventions may provide better outcomes for the child in the long term than through the alternative of a reliance on drugs for behavioral modification.

The construction of the category now called ADHD originated in the late 1960s in the United States with the acceptance that a range of behavioral characteristics defined the medical disorder without a specific requirement to establish evidence of neurological or biological dysfunction (Barkley, 1998). During the 1990s there was a substantial increase in the use of the diagnosis and treatment with medication worldwide. Significant increases in diagnosis have occurred in the United States, Australia, and an increasing number of countries worldwide (United Nations International Narcotics Control Board [INCB], 1996, 1997, 2000). The INCB (1995) expressed serious concern about the uptake of the model of treatment for ADHD in the United States and by other countries. By the end of the century, countries that exceeded Australia's use of methylphenidate included New Zealand, the Cayman Islands, Spain, Iceland, Costa Rica, the United Kingdom, Norway, the Netherlands, Switzerland, Israel, Belgium, and Germany (INCB, 2000). Berbatis, Sunderland, and Bulsara (2002) analyzed the licit consumption of psychostimulants in 10 countries in the period 1994 to 2000 and found the following:

For the 10 countries from 1994 to 2000, total psychostimulant consumption increased by an average of 12% per year, with the highest increase from 1998 to 2000. Australia and New Zealand ranked third in total psychostimulant use after the United States and Canada. (p. 539)

The increased use of the diagnosis has also been associated with a trend towards identification and treatment of the disorder in the early childhood period (Barkley, 1998).

Corresponding with the increased use of the diagnosis in the 1990s there has been strong criticism of the circumstances contributing to the large numbers of children diagnosed with ADHD (Armstrong, 1995; Breggin, 2001; Carey, 1999; INCB, 1995; Jureidini, 1996; Stein, 1999). Concerns have also been expressed over the safety and efficacy of this medical model of intervention with children with behavioral disorders or learning problems (Armstrong; Breggin, 2001; Carey; Jureidini; Stein). The INCB (1995, 1996, 1997, 2000) indicated that the problems of ADHD diagnosis related not only to the spread of nonmedical use of the substances (abuse) but also to the scenario of overdiagnosis the INCB claims has occurred in the United States. To this end the INCB (1995) warned other countries "to exercise the utmost vigilance in order to prevent the 'over diagnosis' of ADD in children and medically unjustified treatment with methylphenidate and other stimulants" (p. 2).

The INCB (1995) and later warnings had little impact on the frequency of use of the diagnosis and medications to treat the condition. Australia used more medication during the late 1990s than the United Kingdom, Sweden, Spain, the Netherlands, France, or Denmark (Berbatis et al., 2002). In Australia during the 6 years between 1994 and 2000 the rate of use of amphetamine type drugs increased by 26% per year with a nearly 900% overall increase in the period (Berbatis et al.). Amphetamine-type drugs are the main class of drugs used to treat the disorder; however, there are many other drugs used to treat the condition. Therefore the overall use of medications to treat the disorder ADHD has increased significantly beyond the figures provided above.

As indicated, the diagnosis of the disorder and treatment with medications usually occurs in early childhood with the majority of children in the 1980s diagnosed with the disorder between the ages of 7 and 9 (Barkley, 1990). The trend through the 1990s has been towards earlier identification of the disorder leading to the use of a variety of medications, but principally amphetamine-type drugs, to children as young as 2 years of age (Barkley, 1998). The effects of the drugs on neurological, educational, social, and behavioral development in early childhood are not well understood and are potentially damaging (Breggin, 2001). The risks associated with medications in early childhood for the individual, or ultimately to the society, are unknown (National Institutes of Health [NIH], 1998).

THE MULTIMODAL TREATMENT STUDY FOR ADHD

In the United States, the significant investment in research sponsored by the United States National Institute of Mental Health (NIMH) into ADHD has focused on short-term behavior modification experiments using medications and has avoided adequately assessing benefits, risks, and threats associated with the drug treatments (Breggin, 2001). In the 1990s, NIMH funded the most expensive research experiment ever conducted into ADHD, the MTA (1999a, 1999b) study. Reviews of the MTA study indicate serious methodological flaws, withholding of crucial data, and reporting of findings that do not truly reflect the effectiveness of behavioral interventions to treat ADHD (Boyle & Jadad, 1999; Breggin, 2000).

The MTA study involved 579 children between the ages of 7 and 9 across six sites in the United States (MTA Cooperative Group, 1999a). The MTA study had a 14-month intervention involving four treatment groups: medication (Med), behavioral (PS),

combined medication and behavioral (CT), and community comparison (A&R; MTA Cooperative Group, 1999a). The Med group had regular monitoring and adjustment of medication levels; the PS group had behavioral strategies implemented; the CT group had both titrating of medication levels and the behavioral interventions; and the A&R group received community treatment, with 65% of the A&R subjects reporting some medication use during the 14-month initial treatment period (MTA Cooperative Group, 1999a).

REPORTING OF THE FINDINGS OF THE MTA STUDY

The findings of the MTA study have been reported widely (MTA Cooperative Group, 1999a, 1999b) and used to support the validity and reliability of the ADHD diagnosis and efficacy of treatment using amphetamine-type drugs (United States House of Representatives, Subcommittee on Early Childhood, Youth and Families, 2000; United States House of Representatives, Committee on Government Reform, 2002). The MTA findings have also been emphasized by the U.S. Surgeon General in Satcher's (1999) *Mental Health: A Report of the Surgeon General*. The MTA Cooperative Group's (1999a) conclusions from the study indicate that:

For ADHD symptoms, our carefully crafted medication management was superior to behavioral treatment and to routine community care that included medication. Our combined treatment did not yield significantly greater benefits than medication management for core ADHD symptoms, but may have provided modest advantages for non-ADHD symptoms and positive functioning outcomes. (p. 1073)

The findings of the MTA Cooperative Group (1999a, 1999b) are used to promote the use of medication and the belief that treatment with medication is more effective than behavior management, parent training, or educational interventions (United States House of Representatives, Committee on Government Reform, 2002). Funding for continuing the MTA study has been applied for up to 108 months with a normative comparison group being added at the 24-month period to provide a pseudocontrol group to the MTA study. The MTA study will be used and quoted in the public domain to support the view that medication outperforms other interventions for the treatment of ADHD. Promotion of selective findings from the MTA study will influence medical practitioners to believe that "Ritalin works" and is the best option for treatment. The MTA study is claimed to prove that titrated medication treatment is superior to behavioral interventions for ADHD (Satcher, 1999). However, the complexity of the study and the interpretation of the findings are controversial. The conclusions of the study as reported by the MTA Cooperative Group (1999a) provide virtually no support for the use and further investigation of behavioral treatments.

CRITICAL REVIEWS OF THE MTA STUDY

Satcher (1999) has reported the findings of the study without reviewing or critiquing the problems of methodology. Breggin (2000) in a review of the MTA study revealed 26 major methodological flaws that call into question the scientific validity and reliability of the study and undermine any possible conclusions made from the MTA data. Breggin (2000) indicated that there were no placebo controls or double blind; that blind classroom

observers found no differences between the groups; there was no control group of untreated children; 32% of the medication management group was already on medication; medication management group subjects were selectively and not randomly chosen (of 4,521 children screened for the trial only 579 were selected); the medication management group was very small (only 2.7% of the original cohort before screening completed the medication management trial) and had been selectively chosen using response to medication as a factor in allocation to the different treatment groups; the children did not rate themselves as improved; most of the subjects were boys; behavioral treatments were stopped earlier than medications; the behavioral treatments were flawed; most children suffered from adverse drug reactions (ADRs); there were not trained observers for ADRs; there was no improvement in academic performance; there was minimal if any effect on social skills; all the researchers were "well known drug advocates" (Breggin, 2000, p. 69); and the parents and teachers were exposed to "pro-drug propaganda." In conclusion to his review Breggin (2000) stated that "the MTA study does not demonstrate the superiority, or even the usefulness, of stimulant medication in the treatment of children labelled with ADHD or any other presumed psychiatric disorder" (p. 71).

Breggin's (2000) critical review is supported by another comprehensive review of the methodology and methods of MTA study. Boyle and Jadad (1999) found that "ambiguity in the overall objective of the MTA study sets the stage for contentious debate over some of the methodological decisions that have been made in the trial" (p. 993).

In a review of the clinical implications of the MTA study, Boyle and Jadad (1999) noted that all treatments used in the study, including behavioral intervention and community care, resulted in reduction of ADHD symptoms. Boyle and Jadad indicated that the MTA study found that intensive regularly reviewed treatments are superior to community care and that long-term (up to 14 months) treatment of ADHD with stimulant medication and/or behavioral intervention is feasible. The key limitations noted by Boyle and Jadad (p. 998) were that the treatments in the MTA study were unlike those used in real-world settings, the participants in the study were highly motivated and compliant and as a result likely to bias the results, and the claim that medication management is superior to behavioral treatment "is subject to conflicting interpretations."

Boyle and Jadad (1999) highlight some of the difficulties associated with the design of the MTA study and the questionable validity of claims made as a result of the findings. Boyle and Jadad drew the following conclusion as a result of their analysis of the MTA study:

Has the MTA study produced valid and relevant estimates of effects for treatments that could be implemented in clinical practice? Most likely not, and for various reasons. (1) The treatments evaluated in the MTA study were both expensive and intensive, limiting the chances of them being implemented in clinical practice. This is a real-world limitation acknowledged by the investigators. (2) The absolute treatment effects obtained in the MTA study and measured in standard units were very high, from about 0.9 to 1.8. In our view, sample filters associated with the referral of subjects and burdensome requirements for participation limited enlistment to motivated families in supportive schools. These families were predisposed to benefit from treatment. This is far less likely among families referred to child mental health settings in the community. (3) Families assigned to medication management possibly had a greater opportunity to benefit from "informal" behavioral interventions than children assigned to behavioral treatment had to benefit from "informal" medication. If this is true, then the relative difference of effect between medication management and behavioral treatment would be misspecified, favouring better outcomes for medication management. (p. 997)

The conclusions of the MTA Cooperative Group—the most expensive and claimed to be the first long-term study into ADHD and its treatments—in light of the reviews by Boyle and Jadad (1999) and by Breggin (2000) appear to be questionable. Promotion of the belief that intervention with children with medication improves their outcomes in the long term should not occur until more definitive scientific evidence is available.

BEHAVIORAL INTERVENTIONS AND RESTRUCTURING THE ENVIRONMENT

A component of the MTA study included participation in a Summer Treatment Program (STP; Pelham et al., 2000). The participants were either in a combined treatment group (receiving medication and behavioral treatments) or in the behavioral treatment group (unmedicated; Pelham et al.). Both the MTA study and the STP component included the use of behavioral strategies (strategies included—a reward/response cost program, peer social skills training, daily report cards, and parent training). In the STP the behavioral interventions were used in conjunction with structured educational and sporting interventions (1 hour per day in an academic special education classroom, 1 hour per day in a computer assisted instructional class, and 1 hour in an art class. Social skills training, sports skills, and sporting activities were also components of the intervention in the STP).

In reporting the outcomes of the STP, Pelham and colleagues (2000) found that “Adjunctive stimulant medication produced relatively few incremental gains on acute functioning and had no effect on rate of improvement for children receiving STP and receiving parent training” (p. 520).

The STP demonstrated very large improvements for ADHD children irrespective of whether they are on medication (Pelham and colleagues 2000). The gains demonstrated in the STP occurred regardless of medication status, socioeconomic status, or parental marital status (Pelham et al.). As Pelham and colleagues indicated:

To our knowledge, however, this is the first study that has addressed whether the rate of improvement with treatment increases with stimulant medication. The STP context, with its daily objective measures, provided a unique opportunity to answer this critical question. The answer appears to be that medication does not facilitate the rate at which children improve in a concurrent, intensive behavioral treatment. (p. 520)

The success of the STP on the outcomes for the group of nonmedicated children provided a strong case for support of systematic long-term behavioral and educational interventions for ADHD. The MTA study itself also provides strong support for the use of behavioral, educational, and parental interventions as alternatives to the use of medication. Of the children in the behavioral group 75% were maintained without medication for 14 months, and 64% no longer met the diagnostic criteria for ADHD as determined through the use of the Diagnostic Interview Schedule for Children (DISC) at the end of the 14-month period (MTA Cooperative Group, 1999a). These findings indicate that behavioral interventions that are systematic and prolonged do offer an alternative to medication (Pelham et al., 2000).

Pelham and colleagues (2000) also support the potential for behavioral/ psychosocial interventions, stating:

Although it is often stated that behavioral treatments are designed to be implemented for a period of time and then eliminated, whereas medication is designed to be given chronically to ADHD children, in fact, leading behavioral therapists have argued for at least a decade that disruptive behavior disorders are chronic conditions that may require treatment for years regardless of whether that treatment is behavioral or pharmacological in nature. The ultimate question of which treatment modality is superior can only be addressed by considering relative costs and relative long-term benefits of the interventions. Behavioral treatments are more expensive than medication, but medication alone has no impact on the negative long-term outcome for children with ADHD. (p. 523)

The findings of the STP component of the MTA study contradict the reported MTA results and suggest that behavioral and psychosocial interventions are a realistic and viable option for intervention of children diagnosed with ADHD. Children who received the behavioral intervention only had outcomes equal to or superior to those who received medication on 25 of 30 dependent measures (81 out of 87 when individual domains for improvement ratings were counted; Pelham et al., 2000). In the three areas where significant differences were shown, the use of medication resulted in a 10% increase in peer relationships, following rules, and good sportsmanship. However, as there were no blind observers to the medication status, perception of medication status alone could account for the differences (Pelham et al.). Of significance was the result in terms of child self-perception ratings where the medicated group had lower absolute levels of self-esteem (Pelham et al.).

DISCUSSION

In the hegemonic discourses concerning ADHD there is no recognition of the rights of the child in being labeled and potentially committed to a psychiatric classification for life from as early as 2 years of age. Since the beginning of time, mankind has recognized that an unstable foundation will not support a structure for any significant period. We, the adults, are negligent in our duty as the advocates for children if we do not address their needs and begin to develop inclusive social structures for their development. The future depends on nurturing a generation of healthy well-adjusted children. The children who are at greatest risk are those who are currently labeled as ADHD. Early intervention for behavioral control using medication needs to be reconsidered in light of the reviews of the MTA study and the findings by Pelham and coworkers (2000) that indicate that medication intervention may not be necessary. Further, the findings of Pelham and colleagues indicate that restructuring of the environment combined with behavioral interventions are effective and can possibly reduce the percentage of children labeled as having ADHD.

It is every child's just and rightful expectation that he or she receives the "best that mankind has to offer" as declared by the United Nations; further, the child shall enjoy special protection to enable him to develop physically, mentally, morally, spiritually, and socially in a healthy and normal manner (United Nations, 1989). The best interests of the child shall be the paramount consideration (United Nations). Unfortunately, in some instances, despite the best intentions of professional bodies operating within the extremely complex mechanisms of modern societies and bureaucracies, basic human rights can become secondary or even be ignored. The overuse of the diagnosis of ADHD and the overstatement of the benefits of medication treatment need to be reviewed in light of the findings of Pelham and colleagues (2000).

It is clear that many parents and teachers do believe that treatment via medications does work and believe that it is beneficial to the child, if not lifesaving. This claim is also made by experts promoting the hegemonic medical model (Barkley, 1998). In combination with the power of the hegemonic medical model discourse, parental lobby groups partially sponsored by multinational pharmaceutical companies have significantly influenced parental beliefs concerning a biological basis for the disorder and the efficacy of drugs for treatment (Breggin, 2001).

Long-term research to date has shown in the 1970s (Barkley, 1977) and through to the present day that the labeling of children with the disorder and treatment with medications does not change learning or behavior outcomes in the long term (Barkley, 1998; Breggin, 2001). It is also clear from the NIH Consensus Conference (1998) findings that the benefits or conversely the damage to the individual or the society from long-term treatment are unknown.

Children labeled as ADHD have a very high risk of developing the so-called comorbid conditions of conduct disorder or oppositional defiance disorder (Barkley, 1998). However, it is unclear whether the labeling and treatment via medication actually contributes to the development of the comorbid conditions. Risks associated with long-term treatment have also been poorly investigated (NIH, 1998) even though the seriousness of such risks and the need to resolve the issues in research were made public in the political arena in the United States in 1970 (U.S. House of Representatives, 1970).

The findings of the STP component of the MTA study and the Pelham and colleagues' (2000) analysis on the effect of behavioral, parenting, and educational interventions do indicate the potential for resolving the problems of children in conflict with parents or teachers caused by their behavior or learning difficulties without resorting to the use of medication as the priority method of intervention. Further research is needed into the use of behavior, educational, and parental interventions that are intensive and sustained for significant periods of time. Until it is clear in scientific research that treatment with medications have a long-term benefit to the child diagnosed as ADHD it may be in the best interests of the child to intervene in the early childhood period using behavioral, educational, and parental programs to improve symptoms and work consistently towards improvement in overall outcomes for the child at risk.

REFERENCES

- Armstrong, T. (1995). *The myth of the A.D.D. child*. New York: Dutton.
- Barkley, R. A. (1977). A review of stimulant drug research with hyperactive children. *Journal of Child Psychology and Psychiatry*, 18, 137-165.
- Barkley, R. A. (1990). *Hyperactive children: A handbook for diagnosis and treatment*. New York: Guilford Press.
- Barkley, R. A. (1998). *Attention-deficit hyperactivity disorder: A handbook for diagnosis and treatment*. New York: Guilford Press.
- Berbatis, C. G., Sunderland, V. B., & Bulsara, M. (2002). Licit psychostimulant in Australia 1984 to 2000: International and jurisdictional comparison. *Medical Journal of Australia*, 177, 539-543.
- Boyle, M. H., & Jadad, A. R. (1999). Lessons from large trials: The MTA study as a model for evaluating the treatment of childhood psychiatric disorder. *Canadian Journal of Psychiatry*, 44, 991-998.
- Breggin, P. R. (2000). A critical analysis of the NIMH multimodal treatment study for attention-deficit/hyperactivity disorder (The MTA study). *Ethical Human Sciences and Services*, 2, 63-71.

- Breggin, P. R. (2001). *Talking back to Ritalin: What doctors aren't telling you about stimulants and ADHD* (Rev. ed.). Cambridge: Perseus.
- Carey, W. B. (1999). Problems in diagnosing attention and activity. *Pediatrics*, 103, 664–667.
- International Narcotics Control Board. (1995). *Report for 1995*. United Nations Publications: No E.96.XI.1. Vienna, Austria: Author. Retrieved March 23, 1998, from <http://www.undep.org/reports/incb95en.htm#IIB4>
- International Narcotics Control Board. (1996, November). *Control of use of methylphenidate in the treatment of ADD: Expert meeting on amphetamine-type stimulants, Shanghai*. Vienna, Austria: Author.
- International Narcotics Control Board. (1997). *INCB sees continuing risk in stimulant medication prescribed for children* [INCB Annual report background note no. 4]. Vienna, Austria: Author.
- International Narcotics Control Board. (2000). *Report of the International Narcotics Control Board for 1999*. Vienna, Austria: Author. Retrieved February 23, 2000, from <http://www.incb.org/e/ar/1999/index.html>
- Jureidini, J. (1996). Annotation: Some reasons for concern about attention deficit hyperactivity disorder. *Journal of Paediatric Child Health*, 32, 201–203.
- MTA Cooperative Group. (1999a). A 14-month randomised clinical trial of treatment strategies for attention-deficit/hyperactivity disorder. *Archives of General Psychiatry*, 56, 1073–1086.
- MTA Cooperative Group. (1999b). Moderators and mediators of treatment response for children with attention/deficit hyperactivity disorder: The multimodal treatment study of children with attention-deficit hyperactivity disorder. *Archives of General Psychiatry*, 56, 1088–1096.
- National Institutes of Health. (1998). *Diagnosis and treatment of attention deficit hyperactivity disorder. NIH consensus statement 1998*. Rockville, MD: Author. Retrieved November 21, 1998, from http://odp.od.nih.gov/consensus/cons/110/110_statement
- Pelham, W. E. Jr., Gnagy, E. M., Greiner, A. R., Hoza, B., Hinshaw, S. P., Swanson, J. M., et al. (2000). Behavioral versus behavioral and pharmacological treatment in ADHD children attending a summer treatment program. *Journal of Abnormal Child Psychology*, 28, 507–526.
- Satcher, D. (1999). *Mental health: A report of the Surgeon General*. Rockville, MD: United States Department of Health and Human Services, National Institutes of Health Institute of Mental Health.
- Stein, D. B. (1999). *Ritalin is not the answer: A drug-free, practical program for children diagnosed with ADD or ADHD*. San Francisco: Jossey-Bass.
- United Nations. (1989). *The convention on the rights of the child*. Geneva, Switzerland: Author.
- United States House of Representatives. (1970, September). *Federal involvement in the use of behavior modification drugs on grammar school children of the right to privacy inquiry: Hearing before a subcommittee of the Committee on Government Operations*. Washington, DC: Author.
- United States House of Representatives, Subcommittee on Early Childhood, Youth and Families. (2000, 16 May). *Ritalin use among youth: Examining the issues and concerns*. Chairman Congressman Castle. Washington. Retrieved August 27, 2001, from <http://edworkforce.house.gov/hearings/106th/ecyf/ritalin51600/oscastle.htm>.
- United States House of Representatives, Committee on Government Reform. (2002, 26 September). *Testimony before the House Government Reform Committee. Are we over-medicating our children? Attention deficit/hyperactivity disorder—Are we over-medicating our children?* Chairman Congressman Dan Burton. Washington: Author. Retrieved January 22, 2003, from <http://www.house.gov/reform/ritalin.02.02.26.htm>.

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