

The Impact of Multimodal Psychosocial Intervention among Children with Attention Deficit Hyperactivity Disorder

Ahmed Al Ansari, MBCHB, FRCPC* Mohammed Medawi Asiri, MBBS**

Objective: Evaluation of the effectiveness of psychosocial intervention in comparison to outpatient management.

Setting: Child and Adolescent Psychiatric Unit, Psychiatric Hospital, Ministry of Health, Bahrain.

Design: Retrospective/cross sectional study.

Method: Group 1 (ROM) consist of twenty children from outpatient and group 2 (MPI) consist of 15 children from day-care, aged 4-16 years, diagnosed with DSM IV ADHD were recruited for the study after four weeks of treatment from 2006-2009.

Result: Twelve (80%) children from daycare group were from non-intact family ($P>.036$). Fourteen mothers (70%) from ROM and 9 mothers (60%) from MPI reported marked improvement in both groups. Blind investigator and therapist/nurse found more improvement among those received more intense psychosocial intervention, group 2 (MPI) ($P>.018$).

Conclusion: Group 2 (MPI) had more psychopathology compared to Group 1 (ROM). The staff and blind investigator reported better improvement among children in Group 2 (MPI). Difficult ADHD cases benefit more from intense psychosocial intervention in Group 2 (MPI).

Bahrain Med Bull 2012; 34(1):

DSM IV defines Attention Deficit Hyperactivity Disorder (ADHD) as one of the most commonly diagnosed childhood psychiatric disorders and it is estimated to affect 3-5% of school age children¹. It is characterized by persistent of hyperactivity, impulsivity and inattention. It is more prevalent among males, tends to run a chronic course and associated with poor outcome in terms of academic achievements and job instability²⁻⁴.

Effective treatment of ADHD is long-term and multimodal⁵. Pharmacotherapy; it is effective in alleviating biological symptoms of inattention, hyperactivity and impulsivity

* Consultant Child Psychiatrist and Associated Professor
Department of Psychiatry
College of Medicine, AGU, Bahrain

** Psychiatry Resident
King Fahad Teaching Hospital
Dammam University, KSA
Email: Ahmedm.alansari@gmail.com

while psychosocial interventions are needed to improve psychosocial behavior and functioning^{6,7}. Although psychosocial treatment has been recommended for improving the social behavior of children with ADHD, there was limited or no support for its efficiency⁷⁻⁹. However, in this multimodal treatment study, children were not highly comorbid, had very motivated well functioning families and each intervention was limited to an hour per week after school. The widely quoted MTA study found out that medical treatment alone was more effective for the core symptoms of ADHD as compared to behavioral treatment and routine community care. In addition, behavioral treatment did not significantly improve ADHD core symptoms when combined with medical treatment¹⁰.

However, further analysis of the MTA study, it was clear that the combination of medication and behavioral treatment resulted in better social academic and emotional functioning, when compared to medication alone, behavioral treatment alone or community care. It was clear that the psychosocial intervention arm of treatment in the MTA study was not tittered for individual child needs compared to the medication arm¹¹. Therefore, it is recommended that psychosocial treatment should be used as the first line of treatment in comorbid cases of ADHD with conduct disorder and preschool children because many providers and families tend to favor psychosocial treatments¹².

The aim of the study is to evaluate the efficacy of multimodal psychosocial intervention, group 2 (MPI) in children with ADHD attending daycare program compared to routine outpatient management, group 1 (ROM), which includes medication and psycho-education.

METHOD

Twenty children from group 1(ROM) and 15 children from group 2 (MPI), aged 4-16 years, diagnosed with DSM IV ADHD were recruited for the study after four weeks of treatment with Methylphenidate from 2006-2009.

Blinded investigator (author 2) completed specially designed form. The following were documented: family structure, parents' social class, source of referral and degree of improvement (mild, marked, no changes or worse). The blind investigator reviewed the medical notes written by doctors and nurses and documented evidence of changes in behavior and clinical symptoms. The treating team members (doctors and nurses) were interviewed and reported their own assessments. The Child Psychiatric Unit social worker contacted all the mothers by telephone and obtained their own assessment regarding the improvement or changes in their children behavior and adjustment at home and school environment. Parents gave their informed consent prior to the inclusion of their children in the study. The social class was constructed following a modified Hollingshead and Redlich five points scale¹³.

Chi Square test was applied to assess differences as applicable.

The Unit Program (MPI):

The MPI utilized behavior modification principles where by positive and punitive consequences are applied within the context of token economy. Targeted behavior are assigned point value, undesirable behavior results into cutting off points or even loss of earning power. Accumulated points totals determine privileges for the following day. With increased accumulation of points, children were granted additional privileges.

Admitted children usually presented with severe conduct problems, frequently associated with poor academic achievement and usually come from underprivileged families. Admission to MPI is recommended either on twenty-four hours basis or as daycare. The MPI programs included social skills training sessions. The school programs are geared to special education and recreation activities. The MPI provides a living and learning environmental in which staff presents opportunity for modeling of prosaically behavior and family counseling. Families are encouraged to participate in the behavior modification of their children at home. Parents/caregivers are also given a weekly evaluation forms to fill concerning their child behavior during the weekend and off unit periods.

RESULT

In group1 (Rom), 19 (95%) were males. Ten (50%) were from low social class (class 4 and 5) and 13 (65%) mothers were homemakers. Five (25%) fathers received college education compared to 3 (15%) mothers. All children had an intact family and 10 (50%) were referred by the family and 5 (25%) by the schools, see table 1.

Table 1: Sex, Parent's Education, Occupation, Social Class and Source of Referral

Variables	(ROM) Outpatient	(MPI) Daycare	P-Value
	(n=20)	(n=15)	
	Number (%)		
Sex			
Male	19 (95)	13 (86.7)	.383
Female	1 (5)	2 (13.3)	
Father Education			
College and above	5 (25)	2 (13.3)	.492
Mother Education			
College and above	3 (15)	2 (13.3)	.585
Father Occupation			
Unemployed–Non skilled	2 (10)	4 (26.7)	.391
Mother occupation			
Home maker	13 (65)	11 (73.3)	.768
Social Class			
Class 4 & 5	10 (50)	12 (80)	.070
Class 1,2,3	10 (50)	3 (20)	
Family Structure			
Intact	20 (100)	12 (80)	.036
Non-Intact	0 (0)	3 (20)	
Source of Reference			
Family	10 (50)	7 (46.7)	.498
School	5 (25)	4 (26.7)	
Health care	5 (25)	4 (26.7)	

In group 2 (MPI), 13 (86.7%) were males. Two (13.3%) parents received college education and 12 (80%) were from low social class (class 4 and 5). Eleven (73.3%) mothers were homemakers. Three (20%) children were from divorced/separated parents. Seven (46.7%) children were referred by families and 4 (26.7%) by the schools.

Table 2 shows the degree of improvement by mothers/Doctors Nurses and blind investigator. Mothers reported high level of improvement during treatment period and after discharge, 14 (70%) from ROM and 9 (60%) from MPI cases, such differences was not significant, P value .474. Only one mother from MPI group reported no improvement.

Table 2: Percentage Improvement by Mothers, Therapist/Nurse and Investigator

Improvement	(ROM) (n=20)	(MPI) (n=15)	P-Values
	Outpatient Group	Daycare Program	
	Number (%)		
Mothers			
Little	6 (30)	5 (33.3)	
Marked	14 (70)	9 (60)	
No improvement	0 (0)	1 (6.7)	.474
Worse	0 (0)	0 (0)	
Therapist/Nurse			
Little	0 (0)	5 (33.3)	
Marked	12 (60)	7 (46.7)	
No improvement	8 (40)	3 (20)	.018
Worse	0 (0)	0 (0)	
Investigator			
Little	5 (25)	4 (26.7)	
Marked	7 (35)	8 (53.3)	
No improvement	7 (35)	3 (20)	.551
Worse	1 (5)	0 (0)	

Doctor/Nurse reported better outcome in favor of MPI group P value .018. Blind investigator reported high level of improvement among MPI cases but the differences did not reach significant level, P value .551.

DISCUSSION

Compared to other studies, we found that the combined treatment arm (group 2) was superior to medication/psycho education administered in a routine clinic practice (group 1). Parents and therapists documented the positive effect of psychosocial intervention. The blind investigator did not agree with doctors from ROM on their assessment of marked improvements. This raised doubt about doctor's documentations for what they considered as marked improvement. The psychosocial intervention was equally effective when applied to more disturbed children such as those enrolled in the group 2 (MPI). More children from group 2 (MPI) belonged to broken families and low social class status compared to ROM group. This reveals that behavioral therapy may be useful adjunct to methylphenidate¹⁴.

Mothers reported favorable outcomes for both groups compared to therapists and blind investigator. This might be due to mother's longer time of observation and the effects of maturation. Mothers focus on social skills in a wider range of interactions compared to others. The blind investigator and nurses from MPI reached to the same conclusion. Nurses followed structured note keeping and records of behavior compared to the outpatient clinic doctors; therefore, it was easier for blind investigator to decide on the ratings.

Males in the study group far exceeded females partly due that girl with ADHD display lower level of activity, lower rate of other externalizing behaviors and school suspension, which may affect the referral pattern^{2,12}. Potential confounding effects of referral bias, comorbidity and diagnostic procedures were among the incremented factors for such gender difference.

Study Limitations:

1. The study uses a retrospective collection of data, which proved to have its limitations.
2. Severity of impairment in the two groups was different; therefore, one would expect greater improvement in group 2 because they had greater impairment to begin with.
3. Patients were not randomly assigned.
4. The improvement of social functions in some cases might be due to maturation effects or other uncontrolled factors.
5. The targeted behavior was not specified and the severity might not be the same in all cases. Mothers and therapist might not address the same concerned behavior.

CONCLUSION

Cases attended daycare program (MPI) had more psychopathology compared to those attended outpatient clinic. The therapist and blind investigator reported better outcome among children attended the MPI. The mothers reported marked improvement in both groups. This indicates that difficult cases of ADHD benefit more from an intense psychosocial intervention in addition to medication. A measure of functioning versus improvement would have been more useful.

Author contribution: All authors share equal effort contribution towards (1) substantial contributions to conception and design, acquisition, analysis and interpretation of data; (2) drafting the article and revising it critically for important intellectual content; and (3) final approval of the manuscript version to be published. Yes

Potential conflicts of interest: No

Competing interest: None **Sponsorship:** None

Submission date: 2 January 2012 **Acceptance date:** 7 February 2012

Ethical approval: Approved by the research committee in psychiatric hospital.

REFERENCES

1. Buitelaar JK. Epidemiology: What have We Learned over the Last Decade. In: Sandberg S, Ed. *Hyperactivity and Attention Disorders of Childhood*. 2nd ed. UK: Cambridge University Press, 2002.
2. Gaub M, Calson CL. Gender Differences in ADHD: A Meta Analysis and Critical Review. *J Am Acad Child Adolesc Psychiatry* 1997; 36(8): 1036-45.
3. Weiss G, Hechtman LT. *Hyperactive Children Grown Up: ADHD in Children, Adolescents, and Adults*. 2nd ed. USA: New York Guildford Press, 1993.
4. Soorya LV, Halpern D. Psychosocial Interventions for Motor Coordination, Executive Functions and Socialization Deficit in ADHD and ASD. *Primary Psychiatry* 2009; 16(1): 48-54.
5. Knight LA, Marry Rooney MA, Chronis-Tuscano A. Psychosocial Treatments for Attention-Deficit Hyperactivity Disorder. *Current Psychiatry Reports* 2008; 10: 412-8.

6. Evans SW, Schultz BK, Sader JM. Psychosocial Interventions Used to Treat Children with ADHD: Safety and Efficacy. *J Psychosoc Nurse Men Health Serv* 2008; 46(8): 49-57.
7. Kutcher S, Aman M, Brooks SJ. International Consensus Statement on Attention - Deficit/Hyperactivity Disorder (ADHD) and Disruptive Behavior Disorders: Clinical Implications and Treatment Practice Suggestions. *European Neuropsychopharmacol* 2004; 14(1): 11-28.
8. Abikoff H. Cognitive Training in ADHD Children Less to It than Meets the Eye. *J Learn Disabil* 1991; 24(4): 205-9.
9. Abikoff H, Hechtman L, Klein RG. Symptomatic Improvement and Children with Long Term Methylphenidate and Multimodal Psychosocial Treatment. *J Am Acad Child Adolesc Psychiatry* 2004; 43(7): 802-11.
10. MTA Cooperative Group. A 14 Month Randomized Clinical Trial of Treatment Strategies for Attention, Deficit/Hyperactivity Disorder. *Arch of Gen Psychiatry* 1999; 56(12): 1073-86.
11. Green RW, Ablon JS. What Does the MTA Study Tell Us about the Effective Psychosocial Treatment for ADHD? *J Clin Child Psychol* 2001; 30(1): 114-21.
12. Ghuman JK, Arnold LE, Anthony BJ. Psycho Pharmacological and Other Treatments in Preschool Children with Attention - Deficit/Hyperactivity Disorder: Current Evidence and Practice. *J Child Adolesc Psychopharmacol* 2008; 18(5): 413-47.
13. Hollingshead AB, Redlich FC. *Social Class and Mental Illness: A Community Study*. USA: New York Willey, 1958.
14. Bauermeister JJ, Shrout PE, Chaves L, et al. ADHD and Gender: Are Risks and Sequelae the Same for Boys and Girls. *J Child Psychol Psychiatry* 2007; 48(8): 831-9.