ABSTRACT
        The need for guidelines for early intervention of children
experiencing Attention Deficit Hyperactivity Disorders (ADHD) was identified
by the Australian Early Intervention Network (AusEinet). This document
attempts to guide appropriate practice in the care of children and
adolescents with ADHD. The guidelines are designed to provide information to
assist decision making and are based on the best practice information
available. Chapter 1 discusses the search strategies developed to retrieve
articles on early intervention in ADHD including practice guidelines; cases
studies; difficulties with diagnosis in pre-school; and assessment
procedures. Chapter 2 considers the prevalence, diagnosis, and assessment of
ADHD in preschool children. Chapter 3 looks at the evidence for treatment
strategies as with parental behavior management; special classroom programs;
social skills training; pharmacotherapy; and diet. Chapter 4 reviews
assessments such as developmental assessment; parent-child interaction and
family functioning; and functioning in other environments. Chapter 5 provides
conclusions about management of ADHD in preschool children. (Contains 66
references.) (JDM)

Attention deficit hyperactivity disorder

in preschool aged children

**Clinical approaches to early intervention
in child and adolescent mental health**

Volume 1

2

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Volume 1

Series editors:
Robert Kosky, Anne O'Hanlon, Graham Martin and Cathy Davis
The University of Adelaide and Flinders University of South Australia

Attention deficit hyperactivity disorder

in preschool aged children

Philip Hazell

University of Newcastle

The Australian Early Intervention Network for Mental Health in Young People

2000

The opinions expressed in this document are those of the authors and are not necessarily those of the Commonwealth Department of Health and Aged Care.

This document is designed to provide information to assist decision making and is based on the best information at the time of publication.

This document provides a general guide to appropriate practice, to be followed only subject to the individual professional's judgement in each individual case.

A copy of this book can be downloaded from the AusEinet website:
http://auseinet.flinders.edu.au

Design and layout by Foundation Studios

SUGGESTED CITATION
Hazell, P. (2000). Attention deficit hyperactivity disorder in preschool aged children. Vol. 1 in R. Kosky, A. O'Hanlon, G. Martin & C. Davis (Series Eds.), *Clinical approaches to early intervention in child and adolescent mental health*. Adelaide: Australian Early Intervention Network for Mental Health in Young People.

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Foreword to series

There are now about three thousand people who form the Australian Early Intervention Network for Mental Health in Young People (AusEinet) developed since 1997. They include carers, consumers, mental health professionals, policy makers, teachers and others who are interested in the new developments in early intervention for the mental health of young people. The members of the network are linked by our website (http://auseinet.flinders.edu.au), our journal (AusEinetter), the seminars we held across Australia, the first International Conference held in Adelaide in 1999 and by the set of books and guides we have produced for them. The books have so far included two national stocktakes of prevention and early intervention programs in Australia, a comprehensive account of eight model early intervention projects which were subsidised by AusEinet and a general early intervention literature review. Details of these publications can be obtained from our website.

This current series deals with clinical approaches to early intervention for the mental health of young people. The AusEinet team asked some leading clinical researchers in Australia to review the evidence base for recent clinical approaches to early intervention in their particular fields of interest. Only a few mental health problems could be chosen to start the series. We are aware that there are research groups active in other areas and we hope to access their work at a later date.

We are also aware that few programs in the field have been well evaluated; certainly few reach Level I or II evidence, according to the standards recommended by the National Medical Health and Research Council in Australia (levels of evidence are

discussed in the series volumes). Consequently, we asked groups to consult with clinical experts and consumers to develop a consensus view on the best approach to practice in early intervention in their fields.

The volumes so far created for this series include clinical approaches to attention deficit hyperactivity disorder in preschool aged children, anxiety disorders, conduct problems, the perinatal period, and psychological adjustment to chronic conditions. Details of these volumes are available from the AusEinet website. A guide for delinquency will also become available on our website. The National Health and Medical Research Council (http://www.health.gov.au/nmhrc) has produced guidelines on depression in young people aged 13 to 20 years. AusEinet may look at clinical approaches specifically for early intervention in depression in children as well as young people in the future. Guidelines for early psychosis are available through the Early Psychosis Prevention and Intervention Centre (http://home.vicnet.net.au/~eppic/).

The clinical approaches recommended by the authors of the volumes in the series are the responsibility of the authors and naturally reflect their particular interests and those of their expert advisors. While the approaches outlined in this series do not necessarily reflect our views, we consider that it is important to open up a forum for information on early intervention for mental health and to allow our network access to some of the most recent scientific and clinical knowledge in the field. We hope that this series will help bridge the gap between research and practice.

The Editors

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Author

Philip Hazell is Professor of Psychiatry in the Faculty of Medicine and Health Sciences, University of Newcastle.

Expert Advisory Panel

Background

Early intervention, for the purpose of these guidelines, was defined as interventions directed to infants, toddlers, preschool or kindergarten children.

The symptoms of Attention-Deficit Hyperactivity Disorder (ADHD) seem to arise early in childhood, with a mean age of onset being between 3 and 4 years (Barkley, 1990). There is a concern that the diagnosis of ADHD may be applied inappropriately to young children, without due consideration of the normal variations seen in their development and temperament or that a premature diagnosis may be stigmatising. Moreover, the treatment of very young children with ADHD, especially with medication, has, not unnaturally, been viewed with suspicion by many professionals. For these reasons, we have approached the task of describing the evidence for the diagnosis and management of ADHD in young children with caution.

Published practice guidelines for the assessment and management of ADHD consider that young children are a special population, and uniformally advise caution (Dulcan, 1997; National Health and Medical Research Council, 1996). Because negativistic behaviour and tantrums are commonly seen in preschool-aged children, there can be a tendency on the part of parents, teachers and professionals to trivialise the significance of behaviour problems in this age group. Yet, the early age of onset of symptoms of ADHD is associated with higher rates of conduct disorder and predicts more severe symptoms and disability by 8-9 years (McGee, Partridge et al., 1991; Sanson, Smart et al., 1993).

Parents tend to delay presenting their children for assessment. One community study found there was an interval of around three years between the onset of specific symptoms of ADHD and the first assessment by a clinician (Hazell et al., 1996). Therapeutic early intervention for children with ADHD may prevent the development of more severe disruptive behaviour problems in later childhood and adolescence. Protection against the development of conduct problems may prevent adolescent and adult criminal behaviours (Satterfield & Schell, 1997).

A further challenge is that the level of impairment among preschool-aged children presented for assessment of ADHD can range from negligible to severe. To be useful, clinical practice guidelines for early intervention in ADHD need to be applicable to children across this range of impairment.

The need for guidelines for early intervention with ADHD was identified by the Australian Early Intervention Network (AusEinet). The present guidelines have been developed according to the process recommended by the National Health and Medical Research Council (1999).

The document is a general guide to appropriate practice, to be followed only subject to the individual professional's judgement in each case. The guidelines are designed to provide information to assist decision making, and are based on the best information available at the time of publication.

Setting priorities

The Advisory Panel was asked to consider priorities for consideration in searching the literature. The health outcomes for early intervention which were given the highest priority by our panel were:

- reduction in oppositional and aggressive behaviours;
- reduction in hyperactive-impulsive behaviours;
- improvement in parent-child interaction and family function;
- better preschool and school functioning.

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These items were chosen because they represent some of the core disabilities experienced by children with ADHD and their families, and because difficulties in these domains may lead to later problems in cognitive, social and emotional development.

Other areas for better outcomes which were noted by the panel were:

- reduction in inattention and distraction;

- reduction in emotional lability;

- improved teacher-child interactions;

- improved social skills;

- improved motor coordination;

- reduction in accidental injury rates;

- better attendance at clinics;

- increased parent satisfaction;

- increased teacher satisfaction;

- improvement in laboratory measures of attention and hyperactivity.

Potential barriers to change were identified by the panel. Children with ADHD are not often identified as needing special resources and some teachers and parents are wary of the use of medication. These attitudes may deny some children access to an effective treatment. Medical approaches and interventions can be overemphasised at the expense of psychological, social or educational approaches. Administrative requirements, such as the documentation required to prescribe stimulant medication to young children, may discourage the use of some effective treatments. Services for the assessment and management of children with ADHD are limited in some areas, such as rural regions.

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Levels of evidence

Levels of evidence for treatment efficacy are indicated by using the designation recommended by the National Health and Medical Research Council (1999). This is as follows:

Level I   evidence obtained from a systematic review of all randomised controlled trials

Level II   evidence obtained from at least one properly designed randomised controlled trial

Level III-1   evidence obtained from well-designed pseudo-randomised controlled trials (alternate allocation or some other method)

Level III-2   evidence obtained from comparative studies with concurrent controls and allocation not randomised (cohort studies), case-control studies, or interrupted time series with a control group

Level III-3   evidence obtained from comparative studies with historical control, two or more single-arm studies, or interrupted time series without a parallel control group

Level IV   evidence obtained from case series, either post-test or pre-test and post test.

Wherever possible, for treatments evaluated by two or more randomised controlled trials, we calculated a pooled effect size for continuous data, or a pooled odds ratio for dichotomous data. We have reported only the highest level of evidence available for each treatment.

Consensus views

There is an absence of research data on assessment of preschool children with ADHD. Little evidence exists to support one or other assessment procedures. Therefore our recommendations on assessment were derived by consensus among our Advisory Panel, taking into consideration previously published guidelines concerning the psychiatric assessment of young children.

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Strategy for the literature search

A search strategy was developed in order to retrieve articles on early intervention in ADHD (search terms are available on request). Three electronic literature databases were searched including Medline from 1966 to December 1998, PsycLIT from 1966 to December 1998 and ERIC from 1966 to August 1998. MeSH headings for ADHD, minimal brain dysfunction and hyperactivity, were combined with key-word searches for attention deficit disorder with and without hyperactivity, hyperkinesis, hyperkinetic syndrome and abbreviations for ADHD, in order to retrieve all publications on ADHD.

These terms were then coupled with treatment terms, including MeSH headings and keyword searches for methylphenidate, dexamphetamine, stimulants, early intervention, treatment outcome, combined modality therapy, behaviour therapy, behaviour modification, behaviour change, cognitive therapy, drug therapy, family counseling and intervention. MeSH heading and keywords were modified for each database as required. Articles on the treatment of ADHD were then limited by age using MeSH headings and keywords for preschool children, infants, toddlers, kindergarten children and children.

In order to retrieve case reports, letters, established guidelines and recommendations for treatment amongst the pre-school population, the searches were not restricted by document type. A follow-up search was conducted entering names of well-known researchers in the field. Bibliographies of previously published reviews and papers describing original research were also cross-checked.

Hand searching of the Journal of the American Academy of Child and Adolescent Psychiatry, volumes 17(1) to 36(1) for randomised controlled trials or clinical controlled trials identified 5 trials for review. Four were randomised controlled trials and one was a clinical controlled trial. Only two of the randomised controlled trials had been picked up by the electronic literature searches, although we had been able to identify the trials through bibliography searches. The low identification rate through electronic searching (50%) is consistent with other comparisons of hand searching versus electronic searching to identify randomised controlled trials. Unfortunately, hand searching of other journals was beyond the resources of the present project.

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Trials identified

The search uncovered 1118 references in the Medline search, 837 references in the PsycLIT search and 652 references in ERIC search. Of these, 147 articles were initially selected from the Medline search, 153 from the PsycLIT search and 72 from the ERIC search for further review. Duplicates between databases were removed and the initial selections were culled by the author, resulting in 34 Medline, 26 PsycLIT and 22 ERIC abstracts. Additional papers were based on the Advisory Panel's knowledge of the literature.

In summary, from the information available from the abstracts, the search uncovered:

- 5 practice guidelines;
- 11 randomised controlled trials;
- 1 clinical control trial;
- 32 case reports or open label trials;
- 20 miscellaneous papers including narrative reviews and commentary;
- 13 papers concerning the prevalence, validity and reliability of the ADHD diagnosis in preschool;
- 8 papers describing assessment procedures;
- 9 papers describing an intervention.

Data analyses

For randomised controlled trials of treatment, we estimated, where possible, the magnitude of treatment effect by calculating either an odds ratio or an effect size. When a study reported the numbers or proportions who had 'improved' in each of the treatment groups (dichotomous data), we estimated the ratio of the odds of improvement in the actively treated group compared with that in the placebo group. An odds ratio greater than one indicates that a larger proportion improved in the actively treated group as compared to the placebo group.

For studies reporting either baseline and follow-up scores, or a change in scores between baseline and follow-up (continuous data), the effect size was calculated as the number of standard deviations by which the change in score for the actively treated group exceeded that of the placebo group, using the standardised mean

difference. For the studies reporting baseline and follow-up scores, mean change scores were estimated by taking the difference between mean pre- and post-test scores. Standard deviations for mean change scores were calculated using correlations between the means and standard deviations pre and post treatment for the treatment and control groups, similar to the method reported earlier (Hazell et al., 1995).

A positive treatment-placebo difference (or effect size) indicates that the effect was greater (ie. more improvement) in the actively treated group. Pooling of effect sizes and odds ratios was based on both the fixed effects and random effects models, and a test of heterogeneity was performed. Where significant heterogeneity was found between studies, calculations of effect size or odds ratio are reported for the random effects model. Where no significant heterogeneity was found between studies, calculations using the fixed effects model are reported. The random effects model tends to produce higher estimates of treatment effect than does the fixed effects model, but with wider confidence intervals.

Quality of the methods used in the studies

Each of the studies included in the meta-analysis was assessed for quality using the scheme suggested by Schultz, Chalmers et al. (1995). For this purpose 'quality' is defined in terms of the measures taken by the investigators to minimise bias in the study. The studies were scored independently by the author and one member of the Advisory Panel, with discrepancies then resolved by consensus. Items scored were: concealment of treatment allocation schedule (maximum 2 points), generation of allocation sequences (maximum 1 point), inclusion in the analysis of all randomised participants (maximum 1 point), double-blinding (maximum 1 point). It should be noted that ratings are based on methods reported in each paper, and reflect the quality of reporting.

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Prevalence

No studies to date have specifically assessed the presence of ADHD in community samples of preschoolers. In a birth cohort of New Zealand children, hyperactivity was found at age 3 years among 2% of the sample (McGee et al., 1991). This is probably a conservative estimate, since to meet the threshold for diagnosis in this study, the child needed to meet criteria on both symptom checklist and direct observation. Some, usually hyperactive, children may have failed to meet all the criteria because of the novelty of the testing situation. However, 2% of children who were aged 2-5 years and attending primary care paediatricians in the United States were found to meet the criteria for ADHD outlined in the Diagnostic and Statistical Manual of Mental Disorders, revised 3rd edition (DSM-III-R; American Psychiatric Association, 1987). A larger proportion (8%), met criteria for disruptive behaviour disorder (Lavigne et al., 1996). Among a sample of 5 year olds drawn from socially disadvantaged families enrolled in a nutritional support program in the United States, 5.7% met DSM-III-R criteria for ADHD. A further 15% met criteria for some form of disruptive behaviour disorder (Keenan et al., 1997).

More boys than girls of preschool age are identified as hyperactive. Two of the studies reviewed here reported data by gender, and the male to female ratios reported were 1.6:1 (McGee et al., 1991) and 1.8:1 (Lavigne et al., 1996). In all age samples, estimates of the male to female ratio for ADHD range from 4:1 to 9:1 (National Health and Medical Research Council, 1996).

Epidemiological data are still needed to obtain reliable estimates of the presence of ADHD in the preschool population.

Evidence to date suggests ADHD may occur among about one in fifty preschool children and is sufficiently common to warrant clinical attention.

Validity of diagnosis

Critical issues concerning the validity of the diagnostic criteria for ADHD have been reviewed by the National Health and Medical Research Council (1996). With respect to early identification and intervention, the principle concern is that ADHD may be over-diagnosed in the preschool age group when compared with older children. This is because of confusion arising from the levels of excitability and exuberance normally displayed by pre-schoolers. This concern has particularly been raised since the Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV; American Psychiatric Association, 1994) criteria have permitted three subtypes of ADHD to be recognised. These are: combined, predominantly inattentive, and predominantly hyperactive-impulsive types. Field trials of the new criteria conducted in the United States have now shown a skewing in the age distribution of ADHD subtypes. Nearly 80% of those labelled as hyperactive-impulsive are under the age of 7 years (Lahey et al., 1994).

While it has been shown that the children diagnosed as combined, inattentive or hyperactive-impulsive have significantly more behavioural, social and academic impairment than age-matched normal controls (Lahey et al., 1998), evidence for the predictive validity of the DSM-IV criteria for ADHD in preschoolers is not yet available. However, there are longitudinal data describing the outcome of preschoolers identified by various methods as being 'hyperactive'. Of the 2% of a community sample of 3 year olds in New Zealand diagnosed as hyperactive, McGee et al, (1991),

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reported that, at serial follow-up, the number meeting Diagnostic and Statistical Manual of Mental Disorders, 3rd edition (DSM-III; American Psychiatric Association, 1980) criteria for ADD gradually declined. However, at age 15, half the originally hyperactive sample still met criteria for at least one DSM disorder, and a further 25% had significant educational or social impairment (McGee et al., 1991).

In an Australian sample, Sanson et al. (1993) demonstrated that hyperactive and aggressive 7 and 8 year olds were likely to have previously demonstrated these characteristics in their preschool years. In a birth cohort of children followed to second grade, Palfrey et al. (1985) found that parental concern about attention problems increased steadily from 1% in the 14-29 month age band to 9% in the 43 month to school-entry age band. Persistent parental concerns about attention problems were associated with social and emotional concerns. Campbell has demonstrated that less than half of identified hyperactive 4 year-olds met criteria for ADHD at age 6 years, but after this age the identification was more likely to meet DSM criteria (Campbell, 1987; Campbell et al., 1986; Campbell & Ewing, 1990; Campbell et al., 1986; Campbell et al., 1994). Hyperactive preschoolers who did not meet criteria for ADHD at age 6 years continued, however, to have social and academic impairment.

Comment

DSM criteria for ADHD identify a group of preschool aged children who are at greater risk for emotional and behavioural problems than other children. Data are still needed to determine whether DSM criteria discriminate ADHD preschoolers from preschoolers meeting criteria for other disorders. The stability of the diagnosis of ADHD from preschool years to later childhood and beyond has yet to be demonstrated. Preschool aged children who are identified as 'hyperactive' are only moderately likely to fulfil criteria for ADHD, but many will continue to experience difficulties anyway.

Implication for practice

A diagnosis of ADHD established in the preschool age child should be rigorously reviewed once the child has commenced school.

Inter-rater reliability of diagnosis

Satisfactory inter-rater reliability for DSM-III diagnoses of ADHD in preschool aged children has been demonstrated (Lavigne et al., 1994) when the scorers were trained in the same discipline and had used information from questionnaires, direct observation, semi-structured interviews with a parent and developmental assessments.

Implication for practice

The reliability of the ADHD diagnosis using DSM criteria has been established under research conditions, but there is a need to replicate these findings in a naturalistic setting.

Assessment

The American Academy of Child and Adolescent Psychiatry recommends that, in addition to the usual assessment strategies adopted for children, there should be a high index of suspicion of abuse and other social adversity when preschoolers are the subjects of the assessments. Measurement of plasma lead, and the assessment of speech and language development are more likely to be required, than for older children (Dulcan, 1997).

The National Health and Medical Research Council of Australia (1996), the Australian Psychological Society (Garton et al., 1997) and a European expert panel (Taylor et al., 1998) have not made specific recommendations for the assessment of preschool aged children suspected of having ADHD. Generic guidelines for the assessment of infants and toddlers published by the American Academy of Child and Adolescent Psychiatry emphasise the need to maintain a developmental perspective in the assessment of these young children, and to engage the parents in a partnership with the assessment team (Thomas et al., 1997).

These guidelines, however, make several suggestions. As part of the assessment, multiple sources of information should be used, for instance the child, the parents and carers or friends. Assessment should include family interviews and the parents should be given the opportunity to meet with the assessment team without the child

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being present. However, individual assessment of the child should be made. A thorough developmental history of the child is essential, including details of the physical, cognitive, and social development of the child. Details should be obtained about family and social environment and the family medical and psychiatric history.

The quality of the interaction between the index child and other family members should be systematically observed. Standardised instruments may be used to augment the assessment, but their limitation in this context should be acknowledged. The child may require referral for other specialist assessments, such as hearing or motor skills.

Instruments and approaches that have been used world wide in research to try to objectify the assessment of preschoolers for ADHD include:

Observational measures
Play observation (Lavigne et al., 1996)

Teacher ratings
Teacher Assessment of Social Behavior (Lahey et al., 1998)
Social Skills Rating System (Lahey et al., 1998)

Parent ratings
Child Behavior Checklist for Children ages 2-3, 4-16 (Lavigne et al., 1996)
Rochester Adaptive Behavior Inventory (Lavigne et al., 1996)
Behavior Profile used in the American Collaborative Study (McGee et al., 1991)
Behavioural Checklist (Sonuga-Barke et al., 1997)
Behavioural Rating Inventory (Rowe & Rowe, 1994)
Conners Abbreviated Parent-Teacher Questionnaire (Rowe & Rowe, 1994)

Clinician ratings
Diagnostic Interview Schedule for Children Version 2.3 (Lahey et al., 1998)
DSM-IV version of the Disruptive Behavior Disorders Checklist (Lahey et al., 1998)
Children's Global Assessment Scale (Lahey et al., 1998; Lavigne et al., 1996)

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Parent behaviour management

Parent behaviour management refers to educative approaches delivered to parents to enhance their capacity to manage their children's behaviour. These educative approaches can be delivered either individually or to groups. These interventions have been mostly evaluated for their effects on helping children with oppositional behaviours. There are relatively few studies on children selected primarily for ADHD symptoms. Parents are typically offered between 6 and 12 sessions which aim to provide information on ADHD, promote parental attention to more desirable behaviour and optimise communications within the family. The sessions also aim to increase parent awareness of the circumstances of non-compliant behaviour, establish effective reward systems, implement appropriate responses to non-compliant behaviour, manage non-compliant behaviour in public places, and plan responses to future difficult behaviours. Parents may be offered follow-up sessions to reinforce material learned in the program.

Level I evidence

We have identified four randomised controlled trials of parent behaviour management training directed to parents of children in the target age range (Barkley et al., 1996; Pisterman et al., 1989; Pisterman et al., 1992; Strayhorn and Weidman, 1989). In each trial parents received their training in groups. Findings from these studies are summarised in Table 1. The principal outcomes for our interest, previously defined by our Advisory Panel, were the symptoms of hyperactivity and impulsiveness, oppositional behaviour, parent-child interactions and school functioning.

Two studies provided improvement (dichotomous) assessment data for non-compliance, which is a feature of oppositional behaviour (Pisterman et al., 1992; Pisterman et al., 1989). The pooled odds ratio for these combined studies was 10.52

(95% CI 2.57, 43.05, fixed effects model), a result which strongly favours a positive treatment effect.

Only one study provided outcome data for mean time on-task, which is a proxy variable for ADHD symptoms (Pisterman et al., 1992). There was no significant difference on this variable for children whose parents had received behaviour management compared to no-treatment controls.

In the two studies that reported base-line follow-up (continuous) outcomes for ADHD symptoms, there was a non significant trend for treatment to lead to a greater reduction in symptoms than was found in the controls. Pooled effect sizes for change in oppositional symptoms which were calculated from the four studies, were statistically significant and suggested a moderate to a large treatment effect. There was a non-significant trend for treatment to improve the parent-child interactions. These data are summarised in Tables 2, 3 and 4.

Three of the studies identified have included follow-up assessments to determine whether there were sustained treatment benefits (Pisterman et al., 1989; Pisterman et al., 1992; Strayhorn & Weidman, 1989). These studies are summarised in Table 5. Two studies presented dichotomous outcome data for oppositional defiant symptoms (Pisterman et al., 1989; Pisterman et al., 1992). The pooled odds ratio for the studies was 5.99 (95% CI 2.36, 15.20) indicating a treatment effect which was sustained.

Only one study provided dichotomous follow-up outcomes for the hyperactive and impulsive symptoms. The effects were found to be not significant. Data from the Strayhorn study were presented in a manner that did not permit pooling with the other studies. Strayhorn and Weidman (1989), reported sustained improvement ratings by teachers of the child's hyperactivity (a proxy marker for ADHD) and in their ratings of global behaviour. By contrast, there were no significant differences for the teacher ratings of aggression (a proxy marker for Oppositional Defiant Disorder) or for reading achievement.

Compliance with treatment was found to be problematic in most studies. Barkley et al (1996) reported that a third of parents attended no parent training at all (Barkley et al., 1996). Like-wise, Strayhorn and Weidman (1989) found only 19 of 45 parents attended all the components of the program. Adherence with treatment was not reported in the two studies by Pisterman et al. (Pisterman et al., 1992; Pisterman et al., 1989).

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Table 1. Randomised controlled trials of parent behaviour management training

Study	Age range of children	Sample size	Numbers completing treatment	Study design	Quality score	Outcome
Pisterman et al. 1989	3–6	Active=25 Control=25	23/25 (92%)	Treatment v treatment delay	0/5	*Dichotomous* >50% improvement in compliance (proxy for ODD symptoms) Active 13/23 Control 1/23 *Continuous* Frequency of non-compliance (proxy for ODD symptoms) Active pre mean 8.0 (sd 6.7) post 3.7 (sd 3.2) Control pre mean 6.0 (sd 5.5) post mean 3.7 (sd 3.7) Percentage negative parent behaviours (proxy for parent child interaction) Active pre mean 9.0 (sd 3.6) post 7.6 (sd 4.8) Control pre mean 10.4 (sd 5.7) post mean 11.1 (sd 4.8)
Pisterman et al. 1992	3–6	Active = 28 Control=29	23/28 (82%)	Treatment v treatment delay	0/5	*Dichotomous* >50% improvement in compliance (proxy for ODD symptoms) Active 15/23 Control 5/22 >100% improvement in time on task (proxy for ADHD symptoms) Active 7/23 Control 5/22 *Continuous* Frequency of non-compliance (proxy for ODD symptoms) Active pre mean 6.0 (sd 5.5) post 3.7 (sd 3.7) Control pre mean 5.9 (sd 4.6) post mean 4.3 (sd 4.4) Time on task (proxy for ADHD symptoms) Active pre mean 30.2 (sd 22.4) post mean 36.3 (sd 36.2) Control pre mean 26.1 (sd 24.0) post mean 36.9 (sd 18.2) Percentage negative parent behaviours (proxy for parent-child interaction) Active pre mean 12.3 (sd 4.6) post 7.6 (sd 3.0) Control pre mean 11.1 (sd 4.5) post mean 11.1 (sd 6.2)
Strayhorn et al. 1989	2–5	Active = 45 Control=44	15/45 (33%)	Experimental v minimal treatment	0/5	*Continuous* ODD symptoms (DSM-III-R) Active pre mean 3.53 (sd 2.49) post (sd 2.62) (sd 2.25) Control pre mean 3.33 (sd 2.68) post mean 2.36 (sd 2.37) ADHD symptoms (DSM-III-R) Active pre mean 6.47 (sd 3.64) post 3.86 (sd 2.87) Control pre mean 5.94 (sd 4.07) post mean 5.10 (sd 4.29)
Barkley et al. 1996	6	Active=39 Control=42	Raw data not available (approx. 66%)	Experimental v minimal treatment	0/5	*Continuous* ODD symptoms (DSM-III-R) Active pre mean 7.4 (sd 2.9) post mean 6.0 (sd 3.3) Control pre mean 6.4 (sd 3.3) post mean 5.5 (sd 3.3)

Table 2. Estimated effect sizes for changes in ADHD symptoms

Study	%Weight	Standardised mean difference (95% confidence interval*)
Pisterman	49.9	-0.75 (-1.36, -0.14)
Strayhorn	50.1	2.29 (1.75, 2.82)
Summary	100	0.77 (-2.20, 3.75)

* χ^2 = 53.75, df = 1, p<.001 indicating significant between study heterogeneity

Table 3. Estimated effect sizes for change in oppositional behaviours

Study	%Weight	Standardised mean difference (95% confidence interval*)
Barkley	26	0.77 (0.32, 1.22)
Pisterman 1989	23	2.63 (1.82, 3.44)
Pisterman 1992	24.8	0.69 (0.09, 1.29)
Strayhorn	26.2	-0.12 (-0.54, 0.30)
Summary	100	0.94 (0.003, 1.88)

* χ^2= 36.48, df = 3, p < .001 indicating significant between study heterogeneity

Table 4. Estimated effect sizes for change in parent interaction

Study	%Weight	Standardised mean difference (95% confidence interval*)
Pisterman 1989	51.6	1.95 (1.24, 2.66)
Pisterman 1992	48.4	4.37 (3.26, 5.48)
Summary	100	3.12 (0.75, 5.50)

* χ^2 = 12.94, df = 1, p<.01 indicating significant between study heterogeneity

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Table 5. Follow-up studies of parent management training

Study	n	Follow-up interval	Outcome
Pisterman et al., 1989	Active=25 Control=25	3 months	*Dichotomous* >50% improvement in compliance (proxy for ODD symptoms) Active 14/23 Control 4/23 *Continuous* Frequency of non-compliance (proxy for ODD symptoms) Active pre mean 8.0 (sd 6.7) post mean 3.2 (sd 2.6) Control pre mean 6.0 (sd 3.7) post mean 4.7 (sd 3.0)
Pisterman et al., 1992	Active=28 Control=29	3 months	*Dichotomous* >50% improvement in compliance (proxy for ODD symptoms) Active 15/23 Control 6/22 >100% improvement in time on task (proxy for ADHD symptoms) Active 5/23 Control 3/22
Strayhorn et al., 1989	Active = 45 Control = 44	12 months	Parent global behaviour rating NS Teacher global behaviour rating p<.05 Teacher rating aggression NS Teacher rating hyperactivity p<.05 Reading achievement NS

Table 6. Estimated effect sizes for change in oppositional behaviours at follow-up

Study	%Weight	Standardised mean difference (95% confidence interval*)
Pisterman 1989	58	1.81 (1.11, 2.50)
Pisterman 1992	42	2.61 (1.80, 3.42)
Summary	100	2.18 (1.40, 2.96)

* χ^2 = 2.16, df = 1, p>.05 indicating no significant between study heterogeneity

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Level II evidence

One paper reports a randomised controlled trial involving three year old children identified as hyperactive on a screening instrument administered to parents through preschool (Weeks & Laver-Bradbury, 1997). Families were placed randomly in a group for home visiting with specific behavioural advice or one for home visiting with non-specific advice. Although the authors claim significantly greater improvement in the treated group compared with the control group, caution should be exercised in accepting this conclusion based on the data they provide, as the numbers responding to each item, standard deviations, and tests of statistical significance were not provided.

Comment

Parent behaviour management is moderately effective in reducing oppositional symptoms, but there is a non-significant trend for reduction in ADHD symptoms and in improvement in parent-child interactions. Odds ratios for dichotomous data can only be calculated from two studies, but these support a positive treatment effect for oppositional behaviours, and do not support a treatment effect for ADHD. Follow-up studies demonstrate a sustained improvement in oppositional symptoms. Data supporting a sustained improvement in ADHD symptoms are equivocal. There are no studies examining the impact of parent behaviour management on child functioning in the longer term. The data suggest parent behaviour management leads to short to medium term improvement in oppositional symptoms, and possibly ADHD symptoms and possibly in parent-child interactions.

Implications for practice

These data provide support for the use of parent behaviour management training to reduce oppositional symptoms in ADHD preschoolers. A limiting factor appears to be parent compliance with treatment.

Special classroom programs

Special classroom management consists of small class sizes, specially trained teachers, the assistance of a teacher's aide, supervision from an expert in classroom behaviour management, and multiple behavioural interventions (Barkley et al., 1996). These interventions may include a token system, response cost and reinforcement, group self-control training, group social skills training, group anger control training,

and a daily school report card with home reinforcement. Children also may have access to a wider range of educational materials than would normally be found in a classroom.

Level II evidence

We have identified one trial comparing classroom behaviour management with a no- treatment control group (Barkley et al., 1996) for aggressive hyperactive children entering school. Approximately two thirds of the children in the study met DSM criteria for ADHD. Study characteristics are summarised in Table 7.

Table 7. Randomised controlled trial of special classroom management

Study	Age of children	Numbers in study	n completing treatment	Design	Quality score	Outcome
Barkley et al. 1996	6	Active = 39 Control = 37	100%	Experimental v minimal treatment	0/5	Continuous ODD symptoms (DSM-III-R) Active Pre mean 7.6 (sd 3.2) Post mean 5.1 (sd 2.9) Control Pre mean 6.4 (sd 3.3) Post mean 5.5 (sd 3.3)

The authors concluded there was a positive effect of special classroom management on a range of parent and teacher report behavioural measures. We estimate an effect size for reduction in parent report oppositional symptoms of 1.66 (95% CI 1.15, 2.18) which suggests a large treatment effect. Unfortunately, the paper does not report effects on ADHD symptoms.

Comment

Special classroom management decreases oppositional defiant symptoms.

Implications for practice

Special classroom programs will reduce oppositional defiant behaviours in aggressive hyperactive children identified at school entry. Benefits of this strategy on ADHD symptoms are unknown, but need investigating.

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Self-control training

These include strategies designed to increase the delay of responses to triggers of in-appropriate behaviours.

Level IV evidence

Six children were treated in an uncontrolled study using self-control training. There was an aggregate increase in response delay (Schweitzer & Sulzer-Azaroff, 1988).

Recreational family therapy

These strategies are aimed at increasing pleasurable interactions between the parents and the child.

One descriptive study suggested that recreational therapy with families may engage previously resistant parents in the on-going treatment of their children (Greenfield & Senecal, 1995).

Social skills training

Social skills among children with ADHD are poor. Training strategies to improve social skills provided on an individual or a group basis have been developed.

Level IV evidence

Five boys treated with social skills training improved on scores rated on a behaviour checklist, but remained within the clinical range in all areas of symptoms associated with ADHD (Boulanger & Langevin, 1994).

Planned activity training

These strategies are aimed at providing an ordered and structured environment for parents and the child.

Level IV evidence

In a case series, structured activities were found to help mothers manage challenging preschoolers (Huynen et al., 1996).

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Pharmacotherapy

Methylphenidate is one of the two psychostimulant medications available in Australia routinely used for the treatment of ADHD. Owing to a relatively brief duration of action (3-4 hours), methylphenidate is usually administered two or three times per day. Safety and short term efficacy are well established in older children and adolescents.

Level II evidence for methylphenidate

We identified 4 randomised controlled trials of methylphenidate which were specifically directed to preschool aged children (Barkley, 1988; Conners, 1975; Musten et al., 1997; Schleifer et al., 1975). These studies are summarised in Table 8. Because three of the four trials used a crossover design, it was not possible to pool the data for the purposes of meta-analysis. Many other trials included four and five year olds within the sample, but the data on these young subjects cannot easily be extracted from the group data.

One study (Conners, 1975) reported dichotomous outcome data for global clinical improvement. The treatment effect was highiy significant. The same author reported a range of continuous outcome data. Some of these data suggested significant treatment effects. The author acknowledges that there was considerable technical difficulty in administering many of the tests to preschool aged subjects, and he questions the reliability of his data. The remaining three studies were crossover trials, which precludes the estimate of a pooled effect size.

All three studies reported significant improvements in measures of oppositional behaviour, while two (Conners, 1975; Musten et al., 1997) report improvements in measures of hyperactive behaviour. The longest trial was only 42 days, hence evidence for sustained benefit has not been established.

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Table 8. Randomised controlled trials of methylphenidate

Study	Age range of children	Numbers in study	n completing treatment	Design	Quality score	Outcome
Barkley 1988	2-4	27	27	Crossover	4/5	Significantly greater child compliance on methylphenidate 0.5 mg/kg/day (mean score 82.3, sd 15.5) than placebo (mean score 71.5, sd 18.6) p < .05. No significant difference in side effects.
Conners 1975	<6	59	56	Placebo control	3/5	Significant and sustained improvement in clinician global rating scores. (Active 27/27 v Control 3/26, $\chi2 = 3.57$, p<.001) Significant reduction in some behaviour checklist items, some measures of motor restlessness, and some measures of cognitive function.
Musten 1997	4-6	41	31	Crossover	3/5	Significant improvement in parent ratings of learning, conduct and hyperactivity. Improvement of attention span but not impulsivity. Significant dose-related increase in side effects.
Schleifer 1975	3-4	26	26	Crossover	4/5	Significant improvement in aggression and hyperactivity.

One randomised controlled trial has specifically included evaluation of the parent-child interactions (Barkley, 1988). Improvements on treatment were statistically significant for only one of seven measures of maternal behaviour ('increased frequency of questions to their child'), and only at a dose of 0.3 mg/kg/day of methylphenidate. A further study which grouped subjects into three age bands (of which 4-6 years was the youngest) found no age-by-drug effect interactions (Barkley et al., 1985).

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One study has reported side effects of methylphenidate in a double-blind placebo controlled cross-over study using doses of 0.3 mg/kg/day and 0.5 mg/kg/day (Firestone et al., 1998). These included irritability, anxiety and insomnia but they were rated higher in the placebo condition than with active treatment at a dose of 0.5 mg/kg/day. Sadness, nightmares, decreased appetite, drowsiness, and loss of interest were rated higher at a dose of 0.5 mg/kg/day than they were with placebo. At a dose of 0.3 mg/kg/day, only decreased appetite was rated higher than with a placebo. There were no significant differences between the placebo and the active treatment for ratings on euphoria, daydreams, stomach aches, headaches, fingernail biting, dizziness, tics or talking less with others.

The authors concluded that the side effects were occurring at a greater rate in the preschool sample than in a comparable study of older children (Barkley et al., 1990). Side effects were found to be present in other studies which were using a dose level of 0.5 mg/kg/day, but were less apparent at the lower dose study of 0.15 mg/kg day. Drug-induced delusions have been reported in a single case study of a 6 year old treated with methylphenidate (Bloom et al., 1988).

Comment

There is evidence for short-term benefits from treatment with methylphenidate: there is a reduction in hyperactive and oppositional behaviours, but not improvement in parent-child interactions. Data are still needed concerning benefits to school adjustment. The risk-to-benefit ratio may be higher for preschool aged children than for older children.

Implications for practice

Methylphenidate will reduce oppositional symptoms and probably hyperactive symptoms in preschoolers with ADHD. Side effects are dose related, suggesting that the lowest effective dose be administered. Owing to a higher risk of adverse side effects, the clinician should be more cautious in prescribing methylphenidate to preschool children than to older children.

Dexamphetamine is similar to methylphenidate in its pharmacological action. It is available within Australia on a PBS authority which significantly reduces the cost of treatment to the family.

Single case study design approaches suggest that dexamphetamine provides clinical benefit in reducing hyperactive behaviours and oppositional symptoms in preschoolers (Alessandri & Schramm, 1991; Speltz et al., 1988).

There is a single case study report of 3 year old child whose symptoms of hyperactivity and oppositional behaviour improved with *fluoxetine* after failing to respond to treatment with psychostimulants and thioridazine. The authors concluded that the child most likely had a co-morbid depression (Campbell et al., 1995).

In a single case study, *fenfluramine* was found to be superior to methylphenidate in the treatment of a hyperactive preschooler with developmental delay (Gadow & Pomeroy, 1990).

In an uncontrolled study (Level IV evidence), four hyperactive preschoolers showed lowered aggression in response to *guanfacine* (Lee, 1997).

There is a single case report of the successful use of *lithium* in the treatment of a six year old boy with co-morbid ADHD and affective disorder (Licamele, 1989).

There is a single case report of the use of *risperidone* in the treatment of a six year old child with putative schizophrenia co-morbid with ADHD (Sternlicht, 1995).

Reported Vitamin A toxicity in a 4 year old child treated with *megavitamin therapy* for minimal brain dysfunction (an earlier term for ADHD) suggests that there are risks attached to this treatment (Shaywitz et al., 1977).

Diet

Dietary intervention is based on the premise that some children may have intolerance to certain food items or additives to foods. The intolerance may be expressed as behavioural symptoms that mimic ADHD symptoms. Evidence for dietary influence on behaviour comes from challenge studies where possibly pathogenic food items are given to the child, or from replacement studies where putative pathogenic food items are removed from the diet.

Altering a child's diet to try and ameliorate symptoms of ADHD, without specific advice from a dietitian, is probably quite common. More than one third of a community

sample of parents of children being treated with psychostimulant medication, stated that they had experimented with their child's diet to see whether it would reduce the behaviour problems (Hazell et al., 1996). Poor diet remains a common parental attribution for behaviour problems in their children (Sonuga-Barke & Balding, 1993).

Level II evidence

a. Challenge studies

There is one study, at level II evidence, that a food colouring may be implicated in exacerbating behavioural symptoms in some preschool aged children (Rowe & Rowe, 1994). This study utilised both an open label and double-blind design. In the open label component 200 children aged from 2 to 14 years were exposed to tartrazine. Tartrazine is a synthetic food colouring that has been implicated in precipitating allergic conditions such as asthma, eczema, urticaria, and migraine. From a possible 800 referred to a paediatric facility for evaluation of possible hyperactivity, 150 children were selected on the basis of a parent report of some behavioural response to tartrazine. Reactions were grouped into irritability, sleep disturbance, restlessness, aggression and poor attention span. Under controlled conditions, reactor status was determined. Reactors showed a dose related increase in irritability, restlessness and sleeplessness compared with non-reactors, but there were no differences detected between the groups in aggression or attention span. These data suggest some children may be sensitive to food colourings such as tartrazine, but the behaviours do not encompass the core symptoms of ADHD.

b. Replacement studies

Preschool children, meeting DSM-III criteria for ADHD, were included in a dietary study which involved a baseline period (3 weeks), followed by a replacement diet (4 weeks) and then a control diet (3 weeks), administered in a randomised order using a crossover design (Kaplan et al., 1989). Parent and daycare worker informants were blind to the dietary status. The replacement diet was free of artificial dyes and flavourings, preservatives, monosodium glutamate, chocolate and caffeine. The main outcome measure was the Conners Abbreviated Questionnaires completed by parents and day-care workers. There was a statistically significant effect for dietary treatment based on parent ratings, but there were no significant differences between the effects of the diets based on daycare worker ratings. Children also had fewer sleep

disruptions while on the additive-free diet. Other trials of dietary management include four and five year olds within the sample, but the data on these young subjects cannot easily be extracted from the group data.

Comment

There is level II evidence for the benefit of general good dietary management for reducing ADHD symptoms and some non-specific problems, such as sleeplessness, in some preschool children. The data do not support targeted dietary management that focuses on a single additive or food colouring as a routine measure, but do suggest that some very selected children may react poorly to tartrazine. However, the study samples have been selective (Kado & Takagi, 1996) and the findings may not generalise to most preschool aged children who may have ADHD.

Other treatments

One study presents Level III-2 evidence for *speech therapy and occupational therapy*. Preschool aged children attending psychiatric clinics because of inattention, speech and motor problems, were offered speech therapy and occupational therapy for 6 months (Rappaport et al., 1998). Children receiving treatment were followed up at school entry to determine how many met DSM criteria for ADHD based on parent and teacher ratings. Rates of ADHD in this group were compared with rates among children who had not accepted treatment. There was a non-significant trend for fewer treated children to meet criteria for ADHD than untreated children. Small sample size and a strong probability that self-selection biased the results mean that few conclusions can be drawn from the data.

There is Level IV evidence that *art therapy* produced possible non-specific benefits for three disabled preschoolers manifesting hyperactive behaviours (Banks et al., 1993).

A single case study showed that antecedent *exercise* was of no benefit in reducing hyperactive behaviour in a preschool aged child (Silverstein & Allison, 1994).

Our literature search has identified no studies in the categories level I-IV that are directed to evaluating the methods of assessment of ADHD in preschool aged children. The following recommendations are therefore based on the reviews of previous consensus documents (Thomas et al., 1997; Dulcan, 1997; National Health and Medical Research Council, 1996), as well as consensus reached by our advisory panel.

General

Generic guidelines for the assessment of infants and toddlers (Thomas et al., 1997) emphasise the need to maintain a developmental perspective and to engage the parents in a partnership with the assessment team. Multiple sources of information should be used. Assessment should include a family interview, and the parents should be given the opportunity to meet with the assessment team without the child being present. Individual assessment of the child is necessary. A thorough developmental history should be taken which includes details of the child's physical, cognitive, and social development. Details should be obtained about the family and its social environment, and the family medical and psychiatric history. The quality of the interaction between the child and other family members should be observed. It is helpful to include both mothers and fathers in the assessment, even when parents are separated or divorced. Extended family may also be a very important source of data, not only on the development of the index child, but also the developmental history of the parents.

Standardised instruments such as behaviour checklists can be used to augment the assessment, but they are limited in the information they provide. The most commonly used version of the Child Behaviour Checklist, for example, has no proven validity below the age of four years, although there is a less comprehensive companion instrument developed for children aged two to three years. Similarly, the DSM-IV

and instruments designed to detect DSM-IV symptoms have not been validated for children below four years of age.

It is important to determine the reason for the referral and the expectations that parents and others have of the assessment. Parents, teachers and other professionals may not share similar levels of concern about the child. Results of previous assessments and details of previous treatments, including the responses to treatments, should be obtained. It is important to note variability in symptoms, and to determine under what circumstances the child functions best.

While assessment traditionally occurs in a clinic or in professional rooms, useful data may be gained by observing the child's behaviour and interactions in the home or preschool environment. These observations can be particularly helpful in complex cases. If direct observation is not feasible, then reviewing video tapes or audio tapes of the child functioning in these settings, can serve as an alternative. It has sometimes been noted that the target symptoms of ADHD can be absent under novel conditions, such as the first visit to the clinic.

Assessment is likely to involve a professional who has been specifically trained in normative and deviant infant and preschool development. Usually this practitioner will work collaboratively with others who have knowledge of the child (eg. preschool teacher or early childhood nurse). There may be a need for further expert assessment (eg. from a speech pathologist, occupational therapist or developmental psychologist). For complex cases, the integration of assessment findings and the formulation of a management plan may be best achieved through a case conference. Collaborating professionals may then outline the goals and objectives of their intervention over a specified period.

Developmental assessment

Assessment of a child's development should encompass the attainment of language, cognitive, social and motor skills. Temperament, sleeping and eating habits, and toilet training would usually be covered within the developmental domain. Delays in development should be distinguished from the loss of previously acquired skills.

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The clinician should consider environmental factors, such as deprivations or losses, that could have interfered with the acquisition of skills. Preschool, early childhood nursing or child-care professionals may provide important information concerning the child's development. Referral may be required for specialist speech and language evaluation, cognitive assessment or systematic screening of development using, for example, the Denver scale or the Griffiths developmental scales.

Medical history and examination

Medical examinations should give special attention to the presence of a history of seizures, head injury or exposure to environmental toxins such as lead. Prenatal and perinatal history should include details of prematurity, intra-uterine exposure to alcohol, drugs and medication or genetic disorders. A history of medication should be sought, with specific reference to preparations that may affect behaviour, eg. asthma medication, antihistamines, anticonvulsants and steroids. Visual acuity, hearing and fine and gross motor coordination should be determined through a history and examination. More detailed evaluation should be undertaken if indicated. During physical examination, attention should be given to stigmata of neuro-cutaneous disorders, nutritional deficiency, neglect and physical assault. Growth parameters should be documented. Laboratory investigations are usually not warranted unless specifically indicated.

Mental health history and examination

A history of the problems taken from parents or from other informants should include specific enquiry for symptoms of attention-deficit hyperactivity disorder. Symptoms, described in DSM manuals, such as those concerning homework and schoolwork, may need to be adapted to the context of a preschool child. Until there is evidence to the contrary, six positive symptoms in either the inattention domain, or the combined domains of hyperactivity and impulsivity, present for six months or longer, should be accepted as diagnosing the disorder of ADHD.

In order to plan treatment, it is important for the clinician to estimate the severity of the symptoms and the degree of impairment experienced by the child because of them.

While a distinction between pervasive and situational symptoms has implications for severity and for diagnosis in older children, this distinction in preschool aged children is not yet well established.

The clinician should enquire about oppositional behaviour, and apply clinical judgment as to whether the behaviour described is developmentally inappropriate or is excessive. The clinician should also enquire about indicators of intellectual disability, and symptoms of pervasive developmental disorder, such as autism. Other disorders or problems that should be considered in the context of the evaluation of a preschool aged child thought to have ADHD, include aggression, anxiety, depression, obsessions or compulsions and tics. A family history should be taken with specific reference to ADHD, conduct disorders, mood disorders and developmental and learning disorders. Normally this assessment should be augmented with standardised rating scales completed by parents and teachers (see Chapter One).

Parent-child interaction and family functioning

It is helpful to obtain detail of the parents' routine management of the child's behaviour, being mindful that specific approaches to behaviour and parental expectations of development will be influenced by the family's culture and social context. Recent or remote family stresses should be considered, such as parent health and well-being, parent separation, relocation, financial stress and environmental stress. Current mental illness in another family member should be explored.

The clinician should routinely enquire about maternal depression or anxiety. The question, "Have you felt depressed or sad much of the time in the past year?" was found to detect most cases of depression in primary care patients, although this single question was not as specific as a more detailed structured interview (Williams et al., 1999). The approach to questioning is probably more important than the question itself. Clinicians with good accuracy at detecting depression and anxiety usually ask open-ended questions and attend to non-verbal cues (Craig & Boardman, 1997). Clinicians with low accuracy suppress their patients' expressions of emotion by closed questioning, a narrow focus on symptoms and an abrupt manner.

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Family coping patterns, their level of organisation, and the resources available to the parents should also be considered. The latter may include the availability of familial and extra-familial supports for the parents. Assessment of parent-child interaction should include a history of attachment behaviour, and of any prolonged separations. A systematic assessment of attachment behaviour using a standardised procedure such as the 'Strange Situation' is not practical in most clinical settings. However, the clinician may be able to deduce the quality of attachments through maternal reports of the child's infant and toddler years. Observation will reveal the child's proximity seeking behaviour, capacity to be comforted when distressed, the amplitude and duration of response to normal separations, and the child's response when re-united with the parent. Information should also be sought concerning indicators of neglect or abuse. Corroborative history from other sources may be necessary to explore neglect or abuse. Finally, it can be helpful to ask parents about their own childhood experiences of family life, as these experiences may determine their responses to their own child's behaviours.

Functioning in other environments such as preschool and childcare

Information that may be obtained about the child's behaviour outside the home and clinic includes the child's attendance, the level of intellectual function and socialisation with peers and adults. Suspicion about other problems, such as autism, is commonly raised from observations in these settings. It is useful to explore whether the structured environment of preschool promotes the child's self regulation or whether the level of dis-organisation increases. Referral for more detailed assessment of intellectual function may arise from preschool and child-care observations.

Comment

Owing to the instability of the ADHD diagnosis in preschool aged children, it is strongly recommended that the diagnosis should be reviewed once the child has commenced formal schooling.

C h a p t e r   5

Conclusions about the management of ADHD in preschool children

Level I or II evidence is available to support only a limited number of specific management strategies for preschool aged children with ADHD. Published controlled trials to date usually involve children aged more than three years. Recommendations based on these data must therefore be applied cautiously to children less than three years of age. Multi-modal treatment is generally endorsed by existing generic clinical guidelines for ADHD, although it should be noted that there are research data that challenge this recommendation (Bickman, 1997).

The general approach to management should include education of the parents about the nature of ADHD, the child's problems, the factors that may contribute to the problems, the proposed treatments for their problems and the alternatives, and the likely prognosis based on the best scientific knowledge. The decision to treat a child with ADHD requires a long-term commitment by professionals to the patient and the family.

Parent behaviour management is recommended where oppositional behaviour is a presenting feature. There is Level I evidence to support group administered parent behaviour management strategies. This form of treatment may be expected to have a strong effect on oppositional symptoms and parent-child interaction, and a weak or moderate effect on target symptoms of ADHD.

There is Level II evidence supporting a positive effect of *special kindergarten classroom placements* in reducing oppositional behaviour. The impact on ADHD symptoms, parent-child interaction and school adjustment is unknown. There are no data for special preschool placements. Special classroom placement in this context comprises multiple behavioural interventions delivered in the context of an enriched educational environment, where there are a small number of students per teacher. It does not refer to segregation of children affected by ADHD from other pupils.

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There is Level I evidence supporting the efficacy of *methylphenidate* in reducing target symptoms of ADHD (but only Level IV evidence supporting the efficacy of dexamphetamine). It is reasonable to assume that efficacy and safety data for methylphenidate will generalise to dexamphetamine. There is no evidence for improvement in parent-child interaction with psycho-stimulant treatment. Efficacy and side effects are dose dependent. The dose ranges in milligrams per kilogram are equivalent to those used in older children. The lowest effective dose should be administered. Young children may be more vulnerable to the side effects of psycho-stimulant medication than older children. However, adverse symptoms seen in association with psycho-stimulant treatment have also been observed in children who were given inactive placebo.

Evidence for the safety and efficacy of other pharmacological treatments including clonidine, typical and atypical antipsychotics, tricyclic antidepressants, selective serotonin reuptake inhibitors, other antidepressants and mood stabilisers has not been established in control trials.

The evidence for the effectiveness of *dietary management* in preschool aged children with ADHD is not robust. Until there is evidence to the contrary, the recommendation made in the NHMRC guidelines for all age children (National Health and Medical Research Council, 1996) should also apply to preschool aged children. The guidelines state "Dietary manipulation is not recommended in the routine management of ADHD children. If a special diet is instituted, it should be under the careful supervision of a qualified dietitian, preferably with experience in this area."

There is no evidence concerning efficacy or safety for megavitamin therapy, art therapy, social skills training or exercise in this age group.

It is important that the child who is being treated for ADHD is reviewed at regular intervals to *monitor* their physical growth and their social, cognitive and emotional development. Other factors that should be considered at review include adherence to treatment and barriers to adherence, parent stress, changes in the nature of the child's problems, and changes in family circumstances. No data are available to specify review intervals for preschool aged children with ADHD. However, research with other children found review intervals of three months or less were associated with more favourable outcomes than were review intervals of six months (Hazell et al., 1999).

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