Efficacy of the Incredible Years Programme as an early intervention for children with conduct problems and ADHD: long-term follow-up

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Abstract

Background   This study examined the long-term efficacy of the Incredible Years (IY) BASIC Parenting Programme delivered as a preventive intervention with parents of pre-school children who display signs of attention deficit hyperactivity disorder (ADHD) and conduct problems. Families were followed up after the completion of a controlled trial with 11 Sure Start areas in North and Mid-Wales and North West England.

Methods   Participants in the study were 50 pre-school children whose parents had received the intervention. Child ADHD symptoms were assessed at baseline, at follow-up one (6 months after baseline); at follow-up two (12 months after baseline); and at follow-up three (18 months after baseline). Families in the original waiting-list control group were not assessed after follow-up one as they had subsequently received the same intervention.

Results   The significant post-intervention improvements in child ADHD symptoms evident at follow-up one were maintained over time, as demonstrated by statistical and clinical stability of measures. No significant differences were found for ADHD symptoms across each follow-up, indicating that the gains made post intervention were maintained for at least 12 months, with 57% of the sample maintaining scores below the clinical cut-off on the Conners. Eighty-six, 58, and 30 per cent respectively had maintained at least a modest, large, or very large improvement in ADHD symptoms at follow-up three.

Conclusions   Findings from this study suggest that the IY psychosocial treatment programme is a valuable intervention in the longer term for many pre-school children displaying early signs of ADHD.

Attention deficit hyperactivity disorder [ADHD; American Psychiatric Association (APA), 1994, 2000] is currently one of the most common reasons for referral to child mental health services (Barkley 1997), with prevalence estimated to range from 3% to 6% in school-aged children (Szatmari 1992; APA 1994, 2000). The central feature of the disorder is a persistent pattern of inattention, impulsivity and overactivity. Symptoms typically emerge in early childhood, and are notably inappropriate for the child's age and developmental level (APA 1994, 2000).

Course

The natural course of the disorder is discouraging for many individuals. Left untreated, children with high levels of ADHD symptoms are at risk of developing a host of difficulties within educational, personal and social domains (Daley 2006). Children with ADHD are also at increased risk of developing substance abuse, and interpersonal and occupational difficulties that can persist into adulthood (Manuzza *et al.* 1991; Taylor *et al.* 1996).

Comorbidity

The disorder also frequently co-occurs with conduct problems [including oppositional defiant disorder and conduct disorder (CD)]. An estimated 30–70% of children diagnosed with ADHD also meet diagnostic criteria for conduct problems (Szatmari *et al.* 1989a; Biederman *et al.* 1991). Past research suggests that in many cases, this comorbid condition is particularly intractable and resistant to treatment (Loeber 1990; Moffitt 1993; Hinshaw & Melnick 1995; Lynham 1996). These children tend to have poorer outcomes, experience more severe symptoms, more peer rejection, and their parents are more likely to encounter higher levels of psychosocial adversity. These problems lead to increased utilization of health and social services (Abikoff & Klein 1992; Kuhne *et al.* 1997), which poses a major clinical and public health problem (Szatmari *et al.* 1989b).

Treatment

Based on guidance from the National Institute for Clinical Excellence in the UK, and the American Pediatric Association in the USA, a combination of psychostimulant medication (e.g. methylphenidate; MPH) and behaviourally based intervention is considered to be the optimal intervention package for ADHD. Studies examining the efficacy of psychostimulant medication are limited to the short term, and are not effective in all cases (Arnold *et al.* 1997; Pelham 1999). There are also ethical objections to the prescription of psychostimulants, especially to pre-school children and, until recently, no controlled trials had been conducted to examine the safety of psychostimulant medication with this young age group.

The Preschool ADHD Treatment Study (Greenhill *et al.* 2006; Kollins *et al.* 2006; Wigal *et al.* 2006) was the first controlled trial to assess the safety and efficacy of MPH in 183 children aged between 3 and 5 years. The trial was designed to evaluate the short-term efficacy (5 weeks) and long-term safety (40 weeks) in pre-schoolers with ADHD (Kollins *et al.* 2006). Throughout the medication period, the presence of treatment-related adverse events (AE) were noted at each stage. Thirty per cent of parents reported moderate to severe AEs (including emotional problems, sleep disturbance, appetite decrease and irritability), and 11% discontinued treatment because of these events (Wigal *et al.* 2006). This proportion is considerably higher than those reported in similar trials with school-aged children [e.g. the Multimodal Treatment Study of Children with ADHD (MTA; MTA Cooperative Group 1999; Greenhill *et al.* 2001) reported a discontinuation rate because of adverse effects of <1%]. In terms of efficacy, significant improvements in ADHD symptoms were found following MPH treatment compared with a placebo-controlled group with some, but not all doses. However, effect sizes were notably smaller than those reported in the MTA study, suggesting that MPH is not as effective with pre-school children as it is for their school-aged counterparts (Greenhill *et al.* 2006). Furthermore, the sample size was too small to effectively attest to the safety of MPH with pre-school children (Wigal *et al.* 2006).

Alternatively, behavioural-psychosocial treatment (BPT) is considered a suitable first-level treatment for young children presenting signs of ADHD (Conners *et al.* 2001), and there is growing evidence of the efficacy of BPT for parents of children with ADHD, especially if delivered in the pre-school years (Daley & Thompson 2007). The success of BPT for pre-school children is based on the principle that early intervention, before the child's transition to school, and before the child has experienced secondary risk factors such as school failure, peer rejection and antisocial tendency, offers the best opportunity of changing the developmental course of the disorder (Daley 2006).

Parent training

As parents are the child's primary agents of socialization during the pre-school years, parent-training programmes are viewed as an important element of early BPT. Behaviourally based parent-training programmes have been developed to enhance parenting skills, and have been demonstrated to be the most effective interventions for reducing childhood conduct problems, both in clinical and community settings (see Hutchings & Lane 2005).

Over the last two decades, studies have found that some PT programmes are equally efficacious for young children with ADHD. Following PT intervention, improvements have been found in parent–child interaction (Pisterman *et al.* 1989), in compliance and on-task behaviour (Sonuga-Barke *et al.* 2001), and in parent-reported ADHD symptoms and child behaviour problems (Bor *et al.* 2002). Sonuga-Barke and colleagues (2001)

found that intervention with PT significantly reduced ADHD symptoms both clinically and statistically, when compared with a parent counselling and support group (PC&S) and with a waiting-list control group (WL). The effects of intervention were maintained for 15 weeks after treatment. More recently, Bor and colleagues (Bor *et al.* 2002), in an evaluation comparing intervention outcomes from standard and enhanced PT with WL control, found significant reductions in behaviour problems for both intervention conditions when compared with the control group, with sustained improvements at 1-year follow-up.

The Incredible Years basic parent-training programme

Given the pressing demand for evidence-based practice, it is essential that service providers deliver well-researched, empirically validated programmes. While there are numerous parent-training programmes available, few have as much empirical support as the Incredible Years (IY) BASIC parenting programme (Webster-Stratton & Hancock 1998; see Brestan & Eyberg 1998; Mihalic *et al.* 2002; for reviews). The programme has been shown to be effective at 1-month (Webster-Stratton 1998), to 3-year follow-ups (Webster-Stratton 1990). There is also evidence to suggest that this process is cost-effective (Tudor-Edwards *et al.* 2007).

There is now growing evidence to suggest that the IY parent-training programme may be as effective for children with ADHD as they are for children with conduct problems (Scott *et al.* 2001; Hartman *et al.* 2002). In a recent study of pre-school children displaying signs of early emerging ADHD symptoms and conduct problems, Jones and colleagues (2007) found that the IY was successful in reducing ADHD symptoms. Following the delivery of the IY programme, the intervention group demonstrated significantly lower levels of parent-reported ADHD symptoms, compared with the waiting-list control group. These improvements remained significant even controlling for the confounding effects of improvements in observed child deviance, indicating that the programme's efficacy in reducing ADHD symptoms was independent of any improvements in child conduct problems. Fifty-two per cent of children in the intervention condition, compared with 21% in the WL control condition, showed clinically reliable improvements following intervention.

Despite increasing evidence in the literature supporting the short-term efficacy of the IY in reducing ADHD symptoms in pre-school children, there is insufficient research investigating the stability of these short-term gains over time. Establishing long-term efficacy is of particular importance here for two key reasons. First, there is some research to suggest that parenting programmes are not entirely successful with every family, especially in the long term. Unfortunately, the positive effects of many prevention programmes decline rapidly shortly after intervention (Serketich & Dumas 1996). Second, in light of the particular intractability of symptoms associated with this group of children, it is critical to assess outcome stability. The findings from long-term evaluations could point to the need to deliver booster sessions, or to offer additional support at specified time points following the initial intervention (Serketich & Dumas 1996).

Present study

The long-term efficacy of the IY programme was evaluated by following up a community sample of pre-school children that had presented signs of co-occurring ADHD and conduct problems. Follow-ups were carried out 6, 12 and 18 months after baseline, and following the delivery of the intervention in 11 Sure Start Centres in North and Mid-Wales and North West England (Hutchings *et al.* 2007; Jones *et al.* 2007). Specifically, the aim of the study was to evaluate the long-term stability of improvements in ADHD symptoms following intervention with IY reported by Jones and colleagues (2007).

Methods

Participants

Participants in the research were drawn from an existing sample of 133 families that had been previously randomized to one of two conditions on a two to one basis: intervention (PT) and waiting-list control (WL) (the original trial protocol is described in Hutchings *et al.* 2004, and the main findings are reported in Hutchings *et al.* 2007). To meet criteria for the present trial, families were eligible for inclusion if they had a child aged between 36 and 48 months, lived in designated Sure Start areas, and if the child scored above the clinical cut-off on either the problem or intensity subscale of the Eyberg Child Behaviour Inventory (ECBI; intensity score $\geq$127, or problem score $\geq$11; Eyberg & Ross 1978; Eyberg 1980), and on the Hyperactivity subscale of the Strengths and Difficulties Questionnaire (SDQ; hyperactivity score $\geq$7; Goodman 1997).

As Fig. 1 demonstrates, 79 of the 133 families were eligible, with children displaying signs of *both* early onset ADHD and conduct problems. Fifty of these families were in the intervention group, and 29 in the waiting-list control group. Findings
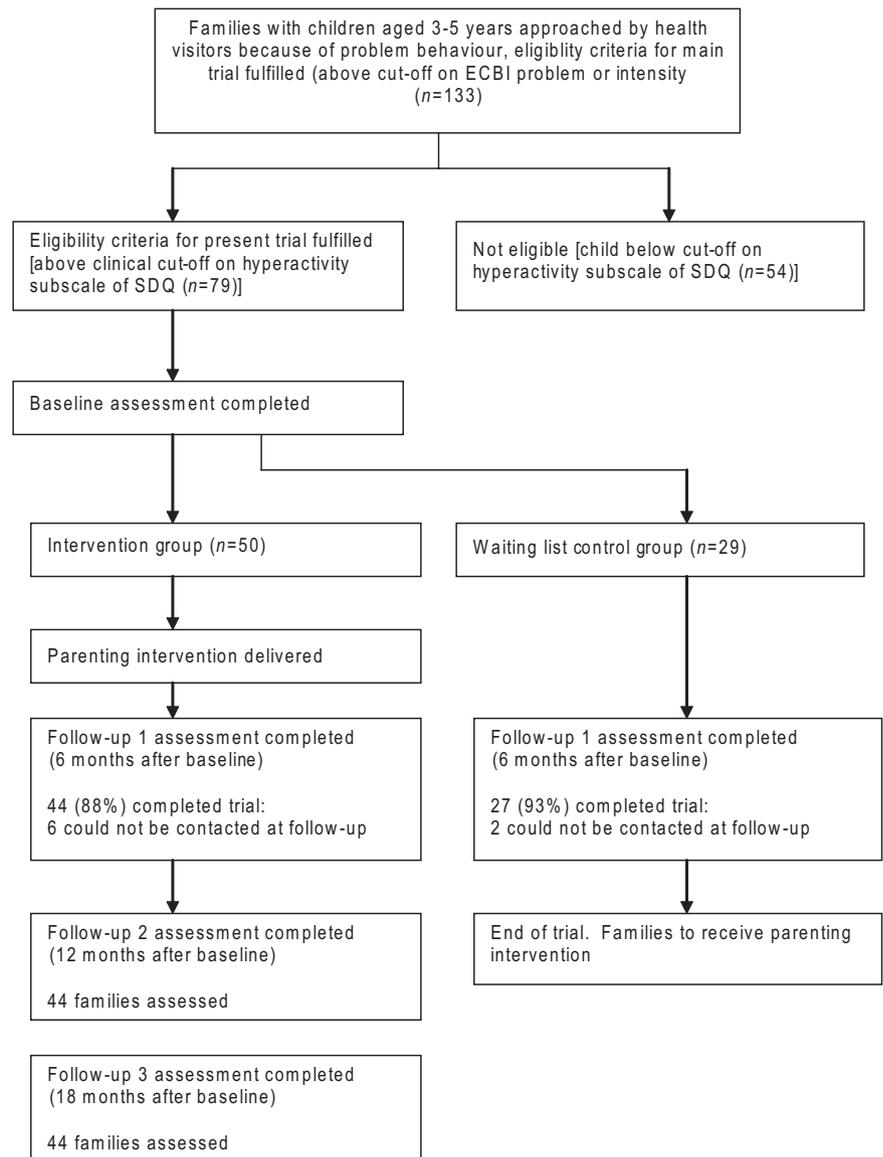
Figure 1. Flow of participants through the study. ECBI, Eyberg Child Behaviour Inventory; SDQ, Strengths and Difficulties Questionnaire.

from the controlled trial, which compared intervention and control families pre- and post intervention are reported in a separate paper (see Jones *et al*. 2007). The present paper represents the longer-term evaluation of the intervention families from the previously reported trial. Intervention families were followed up at 12 months (follow-up two) and 18 months (follow-up three) after baseline. The six intervention families lost to follow-up were included in an intention to treat analysis.

All primary caregivers interviewed were mothers [mean age at baseline 27.54 (SD = 5.80)]. Almost half of the mothers (46%) were lone parents. The mean age of the index child at baseline was 46.50 months (SD = 6.08), and they were

predominantly male (64%). The mean number of children per family was 2.52 (SD = 1.32).

Measures

Child and family factors were assessed using a combination of interview, questionnaire and direct behavioural observation at two separate home visits at each data collection point. The measures were administered to primary care givers on entry to the trial (baseline), and at follow-ups one, two and three (6, 12 and 18 months later). The intervention was delivered within the 6-month period between baseline and follow-up one.

Screening: parent report measures

ECBI (Eyberg & Ross, 1978; Eyberg 1980)

This inventory was used as a baseline screening measure to assess child conduct problems. The ECBI is a 36-item parent report measure that assesses the occurrence of problem behaviours in children aged from 2 to 16 years. Each behaviour is rated on two subscales: a seven-point intensity scale, which measures the frequency of particular behaviours, and a *Yes–No* problem scale that identifies whether the parent perceives the behaviour to be a problem. The scale demonstrates good stability, with reliability coefficients ranging from 0.86 (test–retest) to 0.98 (internal consistency) (Robinson *et al.* 1980). The ECBI has shown good convergent validity, with ECBI scores being significantly correlated with scores on the Child Behaviour Checklist (Achenbach & Edelbrock 1986) and the Parenting Stress Index (Abidin 1990). The ECBI has been shown to discriminate well between children with and without conduct problems (Eyberg & Ross 1978; Baden & Howe 1992).

SDQ (Goodman, 1997)

This 25-item inventory was designed as a behavioural screening measure to assess the occurrence of particular behaviours that have been associated with conduct problems, hyperactivity, emotional symptoms and peer problems in children. The scale has demonstrated good stability, whether judged by internal consistency (mean Cronbach's alpha: 0.73), cross-informant correlation (mean: 0.34) and test–retest stability after 4–6 months (mean: 0.62) (Goodman 2001). In terms of discriminant validity, high SDQ scores have been associated with a strong increase in psychiatric risk (Goodman 2001). In the present study, the hyperactivity subscale of the SDQ was used as a baseline screening measure to identify children within the sample who displayed symptoms of ADHD.

Primary outcome measure: Conners Abbreviated Parent/Teacher Rating Scale (Conners 1994)

This 10-item scale assesses the incidence of ADHD symptoms observed by the parent in children aged 3–7 years. It comprises the most highly loaded symptoms from the factor scales of the Conners Parent and Conners Teacher Rating Scale. The respondent (parent) is asked to rate the frequency of particular behaviours on a four-point scale ranging from 0 (not at all) to 3 (very much). The Conners was the main outcome measure of the study, and was used to assess child ADHD symptoms at baseline and at all subsequent follow-ups.

Observation of mother and child behaviour: Dyadic Parent–Child Interaction Coding System (Eyberg & Robinson 1981)

Mother and child behaviour was assessed using a 30-min live home observation system [the Dyadic Parent–Child Interaction Coding System (DPICS; Eyberg & Robinson 1981)]. The DPICS comprises 37 behaviours relating to both parent and child, which are summarized into four 'parenting' composite variables: (1) positive parenting (including praise, positive affect, physical positive behaviour); (2) critical parenting (including negative commands and critical statements); (3) total commands, and parent non-verbal affect (valence); and three 'child' composite variables: (1) child deviance (including negative and destructive behaviour and non-compliance); (2) pro-social behaviours (including physical warmth and positive statements); and (3) child non-verbal affect (valence).

Observational coding is continuous and records the total frequency of each behaviour per specified interval. The observations were carried out in a naturalistic, unstructured setting, whereby the families were instructed to engage in their normal daily activities for that particular time of day. In order to obtain sufficient parent–child interaction data, families were instructed to stay in one room, and to have TVs and computers switched off.

Six trained observers coded the interactions. In order to maintain inter-rater reliability, observers coded videotaped practice interactions on a weekly basis. Inter-rater agreement was assessed by having 20% of observations coded by a second rater. All coders were blind as to participant group status. An acceptable level of inter-rater agreement was achieved (75%).

Procedure

At each data collection point, participating families were visited at their home on two occasions within a 3-day interval. At the first visit, interview and questionnaire measures were administered to the parent. This visit lasted approximately 1 h. Observational assessments were carried out during the second visit, and lasted about 40 min.

Intervention and treatment integrity

Twelve intervention groups were delivered in 11 Sure Start areas across North and Mid-Wales and North West England. The

programme runs for one 2-h session per week for 12 weeks, and is based on a collaborative approach with two trained leaders introducing a structured sequence of topics over the course of the programme (see Webster-Stratton & Hancock 1998; Hutchings *et al.* 2007, for a more detailed description of course content). All leaders had run at least one group before the study commenced, received 3 h of weekly supervision from the third author and achieved leader certification during, or shortly after, completion of the trial. The programme addresses implementation fidelity by: providing all course materials, CDs, handouts, books, raffle prizes, etc.; ensuring leaders had a 3-day basic leader training and had previous experience in running a group; completion of a group leader Peer and Self-Evaluation questionnaire to evaluate treatment exposure, adherence, treatment delivery; parent completed satisfaction questionnaires; completion of Session Specific Checklists to monitor treatment integrity, participant responsiveness, treatment delivery and treatment differentiation; access to mentor supervision, to evaluate progress and delivery method, e.g. reviewing videotapes within a 3-h weekly supervision session with an IY trainer; and certification – evaluation of treatment fidelity based on observation of random videotapes by an independent IY trainer.

Results

Attrition

Inclusion of cases in the analyses was based on an intention to treat strategy. Out of the 50 intervention families who completed baseline assessment, six were lost to follow-up (18 months after baseline).

Attendance

Forty-four out of 50 (88%) attended at least one session, and 37 (74%) attended eight or more sessions. The overall mean attendance rate was 9.47 sessions (SD = 2.94).

Impact of intervention on conduct problems

The focus of this study is on the impact of the intervention on ADHD symptoms. The intervention was very successful at reducing CD symptoms, both in the short term and longer term, and these results have been presented elsewhere (see Hutchings *et al.* 2007; Hutchings *et al.* 2007; Bywater *et al.* unpublished data).

Short-term findings: impact of intervention on ADHD symptoms

In the short term, the intervention was successful in reducing ADHD symptoms for the intervention group, as compared with the waiting-list control group (Jones *et al.* 2007). Following intervention, the intervention group was associated with lower levels of parent-reported inattention and hyperactive/impulsive difficulties, even after controlling for post-intervention changes in observed child deviance. Fifty-two per cent of those in the intervention condition, compared with 21% in the control condition, showed clinically reliable improvements, yielding a number needed to treat of 3.23 (95% CI 1.98–8.77). These findings are presented in more detail in a separate paper (Jones *et al.* 2007). Further follow-ups of the intervention group were conducted to examine whether these improvements in child behaviour were maintained over time.

Preliminary analyses

Results of Kolmogorov Smirnov tests for all variables were statistically non-significant for all three time points, indicating that the assumption of normality had not been violated.

Long-term findings

From pre- to post-intervention, mean scores on the Conners decreased from 20.56 (SD = 5.86) to 14.6 (SD = 8.12), showing an average reduction in score of 5.96. These mean scores remained relatively stable at subsequent follow-ups, with a mean score of 13.44 (SD = 7.69) on the Conners at follow-up one, and 13.53 (SD = 8.01) at follow-up two.

A series of repeated measures Analysis of Variance ANOVAs, with time as the repeated measure, was used to examine the data. As previously reported, a significant difference in Conners scores was found from baseline to follow-up one (post-intervention): $F(1,78) = 7.28$, $P = 0.009$. At subsequent follow-ups of the intervention group, no significant differences were found from follow-up one to follow-up two, $F(1,48) = 0.70$, $P = 0.41$; and from follow-up two to follow-up three, $F(1,49) = 0.72$, $P = 0.40$. These findings are summarized in Fig. 2, which show mean scores on the Conners for the intervention group at each time point.

Long-term findings: controlling for observed child deviance scores

In order to determine whether the sustained improvements in ADHD symptoms were independent of improvements in
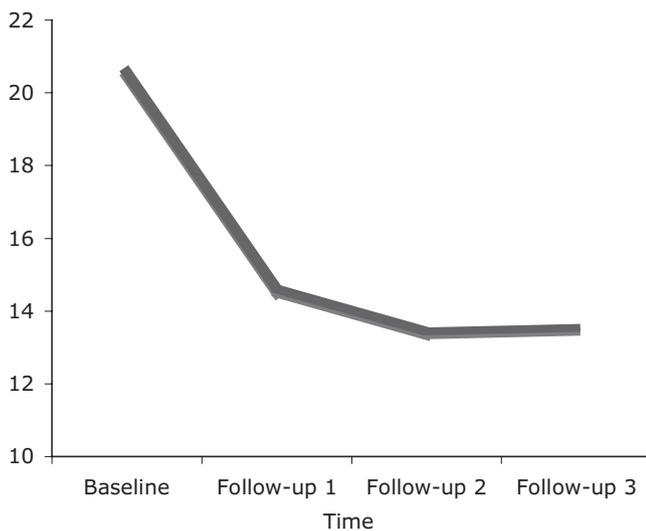
Figure 2. Long-term intervention effects for intervention group from baseline to follow-up three.

observed child deviance, further analyses using repeated measures analysis of covariance ANCOVA was carried out, with observed child deviance scores for each follow-up entered as a time-varying covariate. Results indicated that the maintained gains in ADHD symptoms were not related to sustained improvements in child deviance. Comparing follow-up one to follow-ups two and three, $F(1,47) = 768.44$, $P = 0.83$), and comparing follow-up two to follow-up three, $F(1,47) = 1081.15$, $P = 0.92$.

Clinical significance of change in children's disruptive behaviour

Two criteria were employed to investigate clinical significant change: the Reliable Change Index (RCI; Jacobson & Truax 1991); and a reduction in scores to below clinical threshold on the Conners. Using the RCI criteria, 53% of the group met recovery criteria at follow-up one, 47% at follow-up two and 46% at follow-up three. Using the clinical cut-off criteria, 58% of families had scores that had fallen below the level of clinical concern on the Conners at follow-up one (≤ 15; Conners 1994), 60% at follow-up two and 57% at follow-up three.

Magnitude of improvement

Further analyses were conducted to determine the magnitude of maintained improvements made by the sample at each follow-up. This analysis was conducted using Cohen's (1988)

criteria for magnitude of change (0.3 SD = modest change, 0.8 SD = large change and 1.5 SD = very large change) and is presented in Table 1. An examination of Table 1 demonstrates that the majority of the sample maintained at least a modest improvement, over half maintained at least a large change, and almost a third maintained a very large change across each follow-up. Furthermore, Table 1 shows that the more severe cases (as indexed as being above the clinical cut-off on the Conners as well as the SDQ at baseline) benefited more from the intervention, as evidenced by demonstrating a greater magnitude of change across each follow-up, compared with the sample as a whole. Similarly, boys in the sample maintained slightly larger changes over time than the girls.

Discussion

The results demonstrate that the positive effect of IY parenting intervention on children's ADHD symptoms remained stable over time. Using intention to treat analysis, no significant differences were found in parent reported levels of child inattention and hyperactivity between post-intervention scores and both subsequent follow-ups. At all three follow-ups, families had sustained the significant reduction in ADHD symptoms that was evident at post-intervention assessment, indicating that intervention gains were maintained for at least 12 months after the delivery of the programme, even after controlling for gains maintained in observed child deviance.

Using the RCI criteria, further analysis of intervention efficacy over time demonstrated that around half of the sample showed clinically reliable improvements, at post-intervention and follow-ups, in parent-reported child ADHD symptoms. Similarly, using clinical cut-off as an indicator of clinical improvement, over half of the sample had scores that had fallen below the level of clinical concern on the Conners at each time point.

Using Cohen's (1988) guidelines for magnitude of clinical change, at 18 months after baseline, a large majority of the sample had sustained at least a modest clinically significant improvement, over half maintained at least a large improvement, and almost a third retained a very large reduction in ADHD symptoms. The results indicate that the greatest magnitude of recovery was observed in those who were in most need, as indexed by having more severe symptoms at baseline. This finding is encouraging given the poor prognosis associated with the condition.

Collectively, therefore, the findings support the long-term efficacy of the evidence-based IY parent-training programme for pre-school children presenting signs of conduct problems

Table 1. Indices of clinically significant change

		Proportion of children					
		Follow-up 1		Follow-up 2		Follow-up 3	
	Size of change	In whole sample (*n* = 50)	In those starting above clinical cut-off* (*n* = 40)	In whole sample (*n* = 50)	In those starting above clinical cut-off* (*n* = 40)	In whole sample (*n* = 50)	In those starting above clinical cut-off* (*n* = 40)
ADHD Symptoms	Modest improvement or more (≥0.3 SD)	88%	88%	92%	95%	86%	88%
	Large improvement (≥0.8 SD)	56%	65%	57%	69%	58%	63%
	Very large improvement (≥1.5 SD)	42%	50%	35%	43%	30%	31%
		Males (*n* = 32)	Females (*n* = 18)	Males (*n* = 32)	Females (*n* = 18)	Males (*n* = 32)	Females (*n* = 18)
ADHD Symptoms	Modest improvement or more (≥0.3 SD)	91%	83%	99%	78%	88%	83%
	Large improvement (≥0.8 SD)	66%	42%	61%	51%	58%	50%
	Very large improvement (≥1.5 SD)	50%	37%	34%	44%	33%	30%

*Above clinical cut-off: ≥15 on Conners (Conners 1994).
ADHD, attention deficit hyperactivity disorder.

and co-occurring ADHD (Scott *et al.* 2001; Hartman *et al.* 2003). Not only was the programme found to be effective in the long term reduction of conduct problems (Bywater *et al.* submitted), the intervention was also successful in the long term reduction of ADHD symptoms in this comorbid group of children. The results contribute to previous findings supporting the efficacy of PT for ADHD in pre-school children (e.g. Sonuga-Barke *et al.* 2001; Bor *et al.* 2002), and, more specifically, support the efficacy and utility of the IY programme as a first-line intervention for pre-school children with ADHD symptoms (Jones *et al.* 2007). The fact that the gains were maintained over time, and that greater effects were seen for the more severe cases at follow-ups, suggests that the symptoms are not as refractory as initially thought (e.g. Loeber 1990; Moffitt 1993; Lynham 1996), at least during the pre-school. In this light, the early identification and intervention with young children with ADHD could, potentially, prevent or reduce the risk of more serious problems later in development.

Limitations

The study is not without its limitations. First, the primary outcome measure used was parent-reported. It is widely acknowledged that in the context of intervention, parents' expectations of treatment outcome may bias their responses to self-reported outcome measures. A convergence of self-report and independent observations would have increased the confidence of the findings. Second, the children in the study had elevated scores on measures of both conduct problems and

ADHD. As a result, it was not possible to examine the differential effects of treatment on subgroups of children. Nonetheless, from a clinical perspective, this is typical of the presentation of ADHD and conduct problems at the pre-school age. Third, the children in the sample displayed symptoms of ADHD, as measured by the SDQ hyperactivity scale, which does not necessarily indicate that they will develop the disorder in the future. However, as the children in this study were pre-schoolers, a measure of ADHD symptoms was considered appropriate, given that the disorder is not typically diagnosed until the child reaches the age of 6 years. Finally, although it can be concluded that the intervention effects at post-intervention remain stable for at least 12 months, long-term comparison with a control group was not possible; thus it cannot be concluded that the sustained improvements were attributable to the intervention. However, intervention families demonstrated a maintenance of improvements in hyperactivity that was evident at post-intervention a year previously. No significant improvements were found in the control group at post-intervention assessment, so there is little evidence to suggest that the intervention group improved and maintained gains as a result of spontaneous remission or regression towards the mean of the general population.

Clinical implications

The IY BASIC parent-training programme appears to have a lasting positive effect on ADHD symptoms in pre-school children, and should at least be considered a first-line intervention

for young children with ADHD. The stability of ADHD scores post intervention in this study highlights the utility of early intervention for ADHD symptoms using an evidence-based intervention, delivered with fidelity (Hutchings *et al.* 2007). The fact that the positive influences of intervention were maintained 18 months after the end of intervention, and in the absence of booster sessions, highlights the need for and possible cost-effectiveness of further investment in early preventative intervention services in the UK.

Key messages

- Utilisation of stimulant medication for pre-school children with symptoms of ADHD is a controversial issue, with concerns about adverse effects, reduced efficacy, as well as ethical objections.
- Parent training is considered to be a viable first line intervention for this age group, with increasing evidence of efficacy in the literature.
- The Incredible Years BASIC Parenting Programme is an evidence-based intervention for Conduct Disorder, and there is evidence that the programme is equally effective for children with co-morbid ADHD symptoms.
- As well as establishing short-term efficacy, it is important to assess the stability of post-intervention gains in the longer term.
- The current study findings suggest that the Incredible Years BASIC Parenting Programme is an effective preventative intervention for families of pre-school children displaying signs of early onset ADHD symptoms and conduct problems, with demonstrated long-term stability at 12 months post-intervention.

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