Behavioural treatment of hyperactive children

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SUMMARY This study reports the value of behavioural treatment of hyperactive children. Twelve children with multiple behavioural problems, including concentration difficulties, were identified and treated during a 3-month period. Six of the children began treatment immediately; the other 6 children received similar treatment but after a delay of between 4 and 6 weeks. Children were seen at the clinic or in the home, depending upon the individual difficulties and geographical distances. Initially the families were seen weekly, but the frequency later was determined by the severity of the problems and the response to treatment. There was a significant improvement in the children's behaviour as reported by the parents, the home visitor, and videotaped recordings. During the initial period of between 4 and 6 weeks the treated children improved significantly, whereas the others, as yet untreated, showed no change. As soon as the treatment was introduced to the second group these children's behaviour also improved and to about same extent in 6 weeks as the treated children had in up to 12 weeks' treatment. This interesting observation suggests that a short period of treatment, only 6 weeks, may be sufficient for most children with hyperactivity. This is more feasible with the present-day resources of many departments.

Hyperactive children are not only troublesome to their parents, siblings, and friends, but their behaviour prejudices their own personal integration into life, their education, and that of others with whom they come into intimate contact. They constitute a problem which is severe in terms of its numerical prevalence and effect upon society (Shepherd *et al.*, 1971). It has been suggested that hyperactivity lessens or even disappears as the child grows older, but some investigations (Menkes *et al.*, 1967) have shown that the problems move into other areas—such as difficult social relationships, personal disintegration, and education failure.

It is difficult to give a precise definition of hyperactivity in terms of measures of children's activity because there are no norms. The diagnosis usually depends upon the parents' accounts and complaints together with descriptions by professionals after observations. The difficulties in making a diagnosis are made more difficult because abnormal neurological signs and aetiological factors are often absent, although certain clinical features and abnormal neurological signs may be present from birth which link with difficult behaviour later (Minde *et al.*, 1968; Werry, 1968; Kenny *et al.*, 1971; Rie, 1975; Dubey, 1976; Rutter, 1977).

Drugs often produce only a partial and temporary improvement (Barcai, 1971; Satterfield *et al.*, 1973; Rie, 1975; Stores, 1975; Barkley, 1977), or may lead to adverse side effects. Environmental management is reported to be of considerable importance but it has been little studied (Cantwell, 1975; Pond, 1960, 1961). Observations on older children have shown that they improved after behavioural treatments (Anderson and Plymate, 1962; Patterson, 1964; Allen *et al.*, 1967; O'Leary and O'Leary, 1972; Kauffman and Hallahan, 1973; Ayllon *et al.*, 1975; Wulbert and Dries, 1977), but there has been very little systematic research on the preschool child in the home.

The purpose of this study was to evaluate the benefit of behavioural treatment of young hyperactive children. The treatment was aimed at improving the child's behaviour and enabling the family to perceive that the child was easier to manage. It was given to pre-schoolchildren so that their development and learning should not be hampered by behavioural difficulties.

Materials and methods

This study was on 12 hyperactive children, including one pair of twins. The children were referred by health visitors, general practitioners, and paediatricians because they were restless and unable

to concentrate and their behaviour consequently was difficult and disruptive. These features led us to describe them as hyperactive. Their hyperactivity was demonstrated by the fact that they were unable to remain at tasks of their own choosing for longer than 5 minutes and the shortness of their attention also affected their behaviour in everyday situations. Hyperactivity of this degree is almost invariably associated with other behavioural disorders. The problems which troubled the parents were: *concentration difficulties* (10 children), poor sleep (7 children), biting/hitting (8 children), variable moods (8 children); *outdoor difficulties*, visiting/shopping etc. (7 children), climbing and escaping (6 children); *habit difficulties*, use of wc, dressing, eating (8 children). The parents complained of 5 or 6 major difficulties with each child; they sought help because of these features associated with the hyperactivity. Each case manifested some form of restlessness. In the treatment of some, effort was concentrated on the treatment of the hyperactivity itself, and the associated problems were treated later if necessary. In others it was thought appropriate to concentrate on the difficult behaviour first in order to make it possible for the child to settle.

The experimental design of the evaluation was a time-series model in which the cases acted as their own controls. The families were admitted to the investigation in pairs. After the initial assessments the treatment of one of each pair was delayed for a period of between 4 and 6 weeks; these children formed the control group (group C). The child from the other family was given treatment immediately (group T). The allocation of families to the control or treatment groups was random. It was hoped that in this way two groups would be matched according to the child's development, age, length and severity of problems, and social class.

Visits were made to each child's home to assess the family's concern about the abnormal behaviour, the nature and frequency of this behaviour (Appendix A), and to introduce the treatment plan. Families were given an opportunity to opt out of the study if they wished.

Some of the evaluation was conducted by the home visitor, a trained social worker, employed for the investigation and instructed by one of us (R.T.B.). Her duties were to conduct the detailed interview, assess the child using items from the language and eye/hand co-ordination scales of the Griffiths test (Griffiths, 1954, 1970), use a rating scale, and to videotape the child's play. The mother was asked to record whether the child's behaviour had improved, remained the same, or had worsened in 24 respects during the preceding 4 to 6 weeks (Appendix B).

The treatment programme was undertaken by one of us (R.T.B.), a clinical psychologist. In addition, two nursery nurses who were trained and supervised by R.T.B. helped some mothers to carry out the programme in the home. The treatment methods included teaching the parents, mainly the mother, how to handle the child in a way that would eliminate or alter unacceptable behaviour (Berkowitz and Graziano, 1972; Foxx and Azrin, 1972; Foxx, 1973; Watson, 1973; Gelfand and Hartmann, 1975). For example, to deal with the hyperactivity the mother was taught to sit the child at a table to do a task. The child was made to sit more often and for slightly longer than he would do normally in the first week, longer again in the second week, and so forth, until he could sit for a reasonable length of time for his age and ability. Tasks were chosen which were both interesting and developmentally appropriate. Physical arrangements were designed to keep the child at the task and make it difficult for him to opt out.

The technique was discussed in detail with the mother and a procedure was agreed. The mother was given charts to complete each week to demonstrate the progress. The forms were discussed at the next visit and the task was reset, modified, or abandoned as necessary. Table 5 gives examples of the behaviour in each case, the time taken for improvement, and the extent of improvement.

Two families in each group lived some distance away and so were seen in the clinic and received fewer treatment sessions. The number of times the other families were seen varied depending on progress. In some cases the home was visited twice a week and about 1 or 2 hours were spent with the mother and child to teach the mother how to control the child. In other cases the child's management was discussed with the parent during the weekly visits. The 2 randomised groups were reasonably well matched for sex, chronological age, and development of the child (Tables 1 and 2).

There were 6 boys in group T and 4 in group C; the 2 girls were both in group C. Those allocated to group T were assessed initially at time 0 (assessment no. 0), then they were treated for between 4 and 6 weeks. After this period assessment no. 1 was performed, and active treatment was continued for a further 6 to 12 weeks; at the end of this period a second assessment was

Table 1 *Distribution of age of treated and control cases*

Age	Group T	Group C (controls)
0-2	1	1
2-4	2	3
4-5	3	1
4-7	0	1

Table 2 *Distribution of mental development of treated and control cases*

Developmental level	Group T	Group C (controls)
Below average	3	3
Average	2	2
Above average	1	1

performed. Children allocated to group C were assessed initially at time 0, then behavioural treatment was withheld for 4 to 6 weeks; at the end of this period assessment no. 1 was carried out, and after the next 6 to 12 weeks, during which they were given treatment, assessment no. 2 was performed.

The parents were given the rating scale, and asked to indicate whether each behavioural difficulty was better, the same, or worse than it had been initially. Copies of the rating scale were completed independently by the home visitor at each of the two subsequent assessments.

Results

Tables 3a and 3b give the results of the parents' and home visitors' assessments for 10 children. The maximum possible range of scores was -24 to +24. Table 3a shows that the child with poorest improvement in group T during the first period scored 7. 11 of the 24 behavioural difficulties had become better, 9 were unchanged, and 4 were worse since the study began. The average score at assessment no. 1 was 13.6, with SD 8.8. This shows a significant improvement after treatment (one-sample $t = 3.46$, $P < 0.05$). At assessment no. 2 the mean score was 16.8 with SD 4.9, again showing a significant improvement over the initial assessment ($t = 8.72$, $P < 0.005$), but not a statistically

significant advance on assessment no. 1 (paired $t = 1.06$, NS).

In the controls (group C) the mean adjective score after the period of observation at assessment no. 1 was 1.8 with SD 3.1; this does not represent a significant improvement. At assessment no. 2 after six weeks' treatment, a score of 9.2 ± 5.0 had been achieved, a significant improvement over time 0 ($t = 4.14$, $P < 0.02$). Assessments by the home visitor showed even greater benefits from treatment.

Videotape recordings of 9 children at play were made at assessments no. 0 and 2 (Table 4). The first 7 minutes of each videotape were assessed 'blindly'. The observer viewed the tapes in groups in random order and noted the number of each tape and the durations of co-operative and uncooperative play. The results are presented as the duration of co-operative play expressed as a percentage of the total time. All 9 children in both groups improved significantly from time 0 to time assessment no. 2, by a very primitive binomial test, this is significant at a 2-tailed level of 0.004.

Discussion

This investigation was designed to determine whether behaviour modification treatment is of

Table 4 *Assessment of 7-minute videotape of play. Duration of co-operative play as a percentage of total duration of play recorded*

Group T			Group C		
Case	Assessment		Case	Assessment	
	0	2		0	2
1	36	100	1	4	75
3	10	67	2	33	89
4	32	86	4	29	71
5	26	94	5	21	94
			6	22	71

Table 3a *Parents' assessments taken from the rating scales*

Group	Assessment	N	Best score	Worst score	Mean	SD	t
T	1	5	24 (24:0:0)	7 (11:9:4)	13.6	8.8	3.46 $P < 0.05$
	2	5	24 (24:0:0)	12 (12:12:0)	16.8	4.9	7.72 $P < 0.005$
C	1	5	5 (5:19:0)	-3 (1:19:4)	1.8	3.1	1.29 NS
	2	5	15 (14:10:0)	1 (1:23:0)	9.2	5.0	4.14 $P < 0.02$

Table 3b *Home visitors' assessments taken from the rating scales*

Group	Assessment	N	Best score	Worst score	Mean	SD	t
T	1	5	17 (18:5:1)	8 (10:12:2)	10.4	3.8	6.15 $P < 0.005$
	2	5	17 (17:7:0)	15 (15:9:0)	16.4	0.9	41.0 $P < 0.001$
C	1	5	6 (6:18:0)	-6 (0:18:6)	0.8	4.5	0.39 NS
	2	5	18 (19:4:1)	8 (10:12:2)	12.6	3.7	7.58 $P < 0.005$

value in the management of hyperactive children. The results demonstrate clearly that treatment is of value. Group T showed considerable improvement after only 6 weeks, whereas the group C which did not receive treatment during this period showed no significant change. However, once treatment was given, group C also showed a considerable improvement confirmed by the parents' assessment of the children's behaviour. It may be suggested that the improvement which was measured from the parents' records was purely subjective. However, the parents' records are supported both by the home visitors' records and the independent analysis of the videotapes of the child's behaviour. We believe therefore that this form of treatment is of proved value. One surprising and interesting finding is that there is little difference in the improvement between the 6- and 12-week course of treatment. This suggests that a brief course of treatment—acute

intervention—may be sufficient for many cases, and that a more general use of this form of treatment by other therapists would be practicable. What this investigation does not answer is the length of time that the improvement lasts, nor whether less frequent support thereafter is needed. These questions await another inquiry.

This inquiry did not compare environmental management with drug treatment; our experience with drugs suggests that improvement is limited in its effectiveness and is confined to the period of its administration. Drugs are unlikely to increase skills that are not being used.

Our experience so far suggests that the effects of behavioural treatment extend beyond the period it is given and may extend to other spheres of behaviour.

The behaviour analyses (Table 5) show that specific behaviours—for example use of wc,

Table 5 *Behaviour analyses*

Case	Presenting behaviour	Account of improvement after treatment	Time (weeks)
1	Poor concentration (3–5 min)	10–15 minutes and longer	3
	Constant demand for background music	No music demanded	2
2	Poor concentration (1–2 min)	Will play 30 minutes with toys	3
	Aimless/destructive	Collects toys and books to play with	2
3	Poor concentration (1–2 min)	7–12 minutes many times a day	4
	Cannot self-feed without mess	Competent in feeding and neat	1
4	Continuously talking and restless in play, from toy to toy	Appropriate talk only. Plays well alone	2
	Refuses to go to bed and returns frequently every evening	Improved both in school and at home	
	Demands and argues in shops	Goes to bed and stays there 5–6 nights a week	2
		Appreciates value of money and price of toys, seldom fusses	4
5	Poor concentration (1–2 min)	15–20 minutes, with toys or television often for 30 min	8
	Destructive/aggressive; 8–12 times daily	1–2 most days	6
	Dangerous play, like playing with fire, 2–3 times daily	Not every day	4
	Escaping/climbing, running away 6–8 times a day	No change	10
6	Poor concentration (1–2 min)	10–15 minutes	8
	No toilet training, in nappies	1–2 accidents a week	2
	Falls asleep in living room and wakes up frequently at night	Goes to own bed most nights, sleeps until 4 a.m.	6
	Habit of chewing and biting, etc	Very rare	8
	Table manners, partly spoonfed	Independent and neat at meals	1
7	Poor concentration (2–4 min)	20–25 min	6
	Interrupts play to check on mother every 3–4 min	Plays alone, checks less frequently	4
8	Poor concentration (1–2 min)	10–15 minutes, often longer	4
	Meal times, runs away several times	Sits at table, no fuss	2
9	Unable to concentrate (2–3 min)	10–15 minutes, adult present	6
	Meal times, climbs on table, restless, throws food	Good at table	1
	Night time difficulty	No permanent change	8
10	Fuss at bedtime, every evening	Goes straight to sleep almost every night	2
	Demands dinky feeder several times a day	Bedtimes only, no fuss	2
	Nappy changing difficult	Toilet trained to ask for pot. Few accidents only	3
	Tantrums 5–7 a day	1–3 on 4–5 days	4
11 and 12	No toilet training	Completely independent	2
	Frequent fights during play	Can sit now 20–30 min, also watch television together without fights	6
	Demand bottle frequently, daily	Bedtime only	2

feeding—improved quickly whereas less defined behaviour characteristics—for example concentration—took longer. Other improvements were noted, such as increased sociability, but these were not measured and therefore cannot be documented.

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Appendix A

Problem check list

Name..... Date.....	
General description	Specific problems
	Setting (time, place, etc.)
Behaviour	Frequency/intensity/duration

Appendix B

Rating scale

Try to evaluate the child
How is he now in his behaviour compared with how he used to be?

Name..... Date.....	
	Better Same Worse
1. Active	
2. Difficult to manage	
3. Co-operative	
4. Aggressive	
5. General behaviour	
6. Anxious	
7. Noisy	
8. Happy	
9. Wanting attention	
10. Calm	
11. Sociable	
12. Generous	
13. Discontented	
14. Affectionate	
15. Dependent	
16. Worries me	
17. Nervous	
18. Sleeps better	
19. Plays better	
20. Restless	
21. Obedient	
22. Concentration	
23. Behaviour at meal times	
24. Tantrums	

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