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Hospitalization Can Correct Behavioral Feeding Disorders in Children by Resetting the Pedagogic Climate

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Abstract

Background: Behavioral feeding disorders are common among children, which sometimes become progressive, and consequently, children may refuse to eat anything. Parents have lots of difficulties to reset such a disturbed eating pattern. The aim of this study was to perform an analysis of clinical intervention in behavioral feeding disorders in young children. Methods: We conducted a retrospective analysis of data of 28 children aged 1 - 9 years with behavioral feeding disorders. A pediatrician and pediatric social worker conducted the training in two groups: outpatient or inpatient setting. Both groups were treated with parental education and guidance. The inpatient group also had a temporarily (2 weeks) resetting of the pedagogic climate in a pediatric ward of a general hospital under guidance of a pediatric social worker. Results: Almost all parents were inconsistent in applying appropriate behavioral contingencies during meals. Eleven patients followed 8 months of outpatient treatment and 25 patients followed 2 weeks of inpatient treatment. The overall success rate of outpatient treatment after 2 weeks was 18%, and that of inpatient treatment after 8 months was 88%. The corrected relapse rates are 18% and 56% respectively after 6 months. Conclusion: Short clinical intervention in a structured pedagogic environment is a successful treatment in behavioral feeding disorders. Herewith, pediatricians have a powerful tool for treating behavioral feeding disorders by temporarily resetting and changing the pedagogic climate.

Keywords

Behavioral Feeding Disorder, Hospitalisation, Behavioral Contingencies, Pediatrics

1. Introduction

Behavioral feeding disorders, such as eating low quantities, delay in self-feeding, or restricted food preferences

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are common among children, and up to 25% of the normally developing children and up to 80% of atypical developing children experience some type of feeding problem [1]-[4]. Determination of the difference between physical and psychological factors is difficult, because behavioral feeding problems may persist even after organic difficulties have been resolved [5]. Environmental and parental factors may interact to influence and maintain the problem [5]. Though this subject is not a field for innovative treatments, the need for solutions among parents is very high. General pediatricians frequently encounter parents and give advice about the minimum required dietary intake. They also evaluate the children's physical condition and advice them with ways to deal with the feeding disorder. When the child is really threatened, they can admit the child to their hospital for tube feeding or in a feeding clinic for further treatment. But is there a place for a general hospital to improve feeding techniques by the parents, to improve the pedagogic climate for the parents and to teach them how to manage the feeding problem of their child?

Sporadic information is available on clinical treatment of behavioral feeding disorders. The only described clinical treatments are about prematurely born infants. These studies performed in the 1980s only focused on the weight gain of the children, and concluded that hospitalization leads to appropriate weight gain [6]-[9]. They did not study to reset or manage the feeding disorder. Nowadays, studies mostly focus on treating behavioral feeding disorders in outpatient setting, using multidisciplinary teams and video equipment, which is time-consuming and takes a long time to observe the result of the treatment.

We presume that it would be useful to shorten the duration of treatment of behavioral feeding disorder. Not only because of the fact that it is a very unpleasant condition for the child and his/her family, but also because the feeding problems can persist for 4 - 6 years [10] [11] and that it is believed [12] [13] that childhood feeding disorders are related to (symptoms of) adolescent and adult eating disorders. It can also have influence on the development of behavioral problems [14]-[16] and cognitive development [17].

Our hypothesis is that short and intensive inpatient treatment is a good replacement of outpatient treatment, especially in more severe behavioral feeding disorders.

2. Methods

2.1. Participants

We conducted a retrospective analysis of the data available on the treatment of children with behavioral feeding disorders according to Burklow [18] during the last five years in our general hospital, Hospital Group Twente, location Hengelo, The Netherlands.

For evaluation, 28 children were available, 8 children overlapped in treatments and followed both inpatient and outpatient treatment. We collected data from charts made by their pediatricians and pediatric social workers on family structure, presence of behavioral or psychological child factors, parents with psychological or psychiatric problems, and inconsistencies in parental approach of the child.

The inclusion of behavioral feeding disorders in sub classifications is still open to debate [19], but our patients could be categorized into five types of feeding disorders: feeding disorder of infancy or early childhood, rumination disorder and pica (according to DSM-IV-TR), selective eating [20] [21], and refusal to eat [22]. Sensory food aversion [23] was not evaluated as an individual group, and the children with sensory food aversion experienced more than the aversion alone. The type of feeding disorder was determined from the description of the parents and observations made by our pediatric social worker.

2.2. Treatment Groups

The children were enrolled in inpatient or outpatient behavioral therapy. Inclusion for inpatient or outpatient treatment was based on the estimated severity of the feeding disorder and the burden of the parents (both judged by pediatric social workers). Children who clinically deteriorated badly were enrolled in inpatient treatment. Children whose parents still had energy to try home treatment were enrolled in outpatient treatment. The outpatient group underwent the program at home and the inpatient group was hospitalized in a structured pedagogic climate in a general hospital. In this setting, the patients could be medically observed and a hospital has the ability to temporarily put children in another environment with a medical staff and pediatric social workers. Behavioral therapy is based on the idea that eating is a normal daily habit and that there should be a neutral atmosphere surrounding feeding moments.

2.3. Inpatient Treatment

A day schedule was made with 2 hours of school, 2 hours of playtime, resting hours, 4 hours of visiting time for parents, and 3 mealtimes. The children ate two meals together with our pediatric social worker and other children and one meal in a one to one interaction with a pediatric nurse in the absence of parents. Children over 2 - 3 years of age ate themselves, below 2 - 3 years were "spooned" by the pediatric social worker. No snacks or sweets were given to the children in between the meals, to prevent them from having a feeling of satiety before mealtimes. To ensure a neutral atmosphere during feeding moments, the pediatric social worker ate with the inpatient-trained children in a group with all hospitalized children; they were not pushed to eat everything in their plate, and were not praised for eating well. If necessary, the pediatric social worker prompts a few times; "Dylan, you can take one bite, you are a big boy" or "Mind the time Dylan, you only have 10 minutes left" etc. If the child did not eat at all, the mealtime passed and we started again at the next mealtime. Inappropriate mealtime behavior was corrected: "No Dylan, we do not allow throwing food from this table" or "we do not allow gagging at this table". In the beginning, we start with small amounts, so the child can finish its meal in 20 minutes. At that stage in the training the mealtimes takes 20 minutes. In the course of the training, the amounts of food are increased to age-appropriate portions. The staff determines the amount of food, not the child. When the quantity is too much, the pediatric social worker says how much bites the child has to take in the 20 minutes. At the end of the training, mealtime was ended when the child ate an age appropriate portion, with a maximum of 30 minutes.

Between the meals, the parents are updated and explained what we do. When the child showed an improved pattern of eating, based upon their particular problem for which they were admitted to the hospital, the parents were allowed to watch a meal through a one-way screen and slowly take over the lead of the meals from the pediatric social worker. They start with the meal that is most easy for the child. A video recording is made from the mealtime through the one-way screen, and the interaction in relation to mealtime behavior is discussed afterwards with the parents. When both the parents and pediatric social worker became satisfied with the meals, the child was discharged from the hospital.

Back at home, the parents were asked to fill out an intake list. After 1 week, the situation at home was evaluated with the pediatric social worker. The families were invited for regular (usually monthly) outpatient follow-up during the next 6 months, or longer, if needed. The follow-up was conducted by the pediatric social worker and a pediatrician.

2.4. Outpatient Treatment

During outpatient treatment, there was individual guidance during 30 minute visits at the outpatient clinic by our pediatric social worker. The rules during treatment were the same as those for the inpatient program. So, no in between snacks, no inappropriate mealtime behavior, 20 minute meals, clear prompting, the parents determine the portion-size. The pediatric social worker provided the parents with guidelines for a normal feeding situation as well as advices in changing the particular problems the family experienced. The parents had to make the changes themselves in their own home situation, without direct supervision of a pediatric social worker. Once every 2 weeks, the parents and the child had an appointment with the pediatric social worker in the hospital to evaluate the progress. If necessary, the guidance was adjusted to the new situation. If the treatment had no or little effect, a switch to inpatient treatment could be made. The major difference with inpatient treatment was; no temporarily resetting of the pedagogic climate, no detachment from their parents, and only supervision on a distance.

After successful treatment, the families were invited for regular (usually monthly) outpatient follow-up during the next 6 months, or longer, if needed. The follow-up was conducted by the pediatric social worker and a pediatrician.

2.5. Evaluation

Growth was calculated on the basis of measurements of height and weight during the visits to the clinic. These measurements were compared with the normal growth curves of the Dutch children (using Growth Analyser 3.5, Dutch Growth Foundation, The Netherlands, 2006, available on http://www.growthanalyser.org/) to calculate the standard deviation of weight and height. We analyzed the amount of additional problems that the children

experienced, based on parental reports. The problems that we analyzed were recurrent infections, constipation, incontinence (for both urine and feces), sleeping problems, tiredness, and behavioral problems.

Success was defined when the volume of foods consumed during the meals were increased to age appropriate portions (according to the Dutch Center of Food) [24], together with a consistent manner of handling future (feeding) problems by the parent. The slow eating or selectively refusing to eat one or two items were tolerated. The pediatric social worker determined whether the feeding disorder was sufficiently treated and whether the child had gained a normal pattern of eating.

Relapses were defined as (partial) regaining their old feeding disorder, based on the findings of our pediatric social worker and parental reports of the child's feeding behavior at home.

Statistical analysis were made with SPSS version 13.0 (SPSS Inc. Chicago, IL, USA) for windows.

3. Results

3.1. Descriptives

In the last 5 years, 33 patients were referred by their general practitioner because of behavioral feeding disorders. For evaluation, we excluded five of them for having either a present medical problem or a medical history that could explain the feeding disorder.

Initially, 8 of the 28 evaluated participants were enrolled in our outpatient program; 20 were immediately enrolled as inpatients owing to the estimated severity of their feeding disorder. After evaluation of the initial treatment, 5 participants of the outpatient group were transferred to the inpatient group after failing the outpatient program and 3 patients of the originally inpatient group were transferred to the outpatient group after failing the inpatient program. Children who received both the treatments were evaluated in the results of both the groups, because the effect of the treatment program was the main outcome of the study. The group characteristics are described in **Table 1**. The age of the children at which they enrolled the program did not differ between the two groups, and ranged from 1 to 9 years.

In the outpatient group, mean height at presentation was −0.96 SD (SD = 0.67) with a mean weight for height of −1.35 SD (SD = 1.09). In the inpatient group, the measurements at presentation were −0.69 SD (SD = 0.76) and −0.96 SD (SD = 1.05) for height and weight for height, respectively.

Children could suffer from one or more additional problems. All additional problems were equally spread over both groups. Three children experienced no additional problems. Nine children had recurrent infections. Seventeen children suffered from constipation and 6 had incontinence for either urine or feces. Furthermore, sleeping problems were reported in 6 participants and tiredness was a problem for 12 children. Parents complained of having a child with behavioral problems in 13 cases.

Twenty-four families consisted of two parents with one or more children, 2 families were formed by a single parent with two or more children, while 2 families consisted of one biological parent, one stepparent, the patient, and the children of the stepparent.

Table 1. Group characteristics.

Characteristics	Groups	
	Outpatients N = 11	Inpatients N = 25
Male:Female	5:6	12:13
Age in years (SD)	3.28 (2.7)	3.25 (2.2)
Selectivity	4 (22%)	9 (36%)
Food refusal	7 (64%)	17 (68%)
Feeding disorder of childhood	1 (9%)	1 (4%)
Rumination	0 (0%)	2 (8%)
Pica	0 (0%)	1 (4%)
Sensory abnormalities	2 (18%)	5 (20%)

Three children were diagnosed with a DSM-IV-diagnosis (e.g. ADHD, conduct disorder, and anxiety disorder) and 19 showed some kind of non-diagnosed behavioral problem as reported by the parents (e.g. aggressive behavior, bad listening to the parents, oppositional problems etc.). Most parents (n = 24) turned out to have behavioral mismanagement (e.g. inconsistencies in the parental approach to the child), which could explain why their child showed behavioral problems.

In addition, in only one family both the parents were consistent in applying appropriate behavioral contingencies during meals, while in three families one of the parents was consistent and the other parent was not. In all the other 24 of the 28 families both parents were inconsistent in applying behavioral contingencies during meals. Complementary, in 6 families, one of the parents was known with psychological or psychiatric problems themselves.

3.2. Outcomes

Two children were treated successfully in the initial outpatient group. Of the 6 who were not, 5 were enrolled in the inpatient program. All 5 were treated successfully in the additional inpatient program. With the 20 patients who started initially with the inpatient program, 17 patients succeeded, while 3 failed the treatment. These 3 were subsequently enrolled in an outpatient program, where they also failed treatment. The results of the per protocol analysis are shown in **Table 2**.

None of the children who were treated successfully in the outpatient group relapsed. In the inpatient group, 8 of the 22 successfully treated children relapsed. Of these 8 children, 4 children did not relapse completely, but partially fell back into their old behavior. When corrected for relapse rate, outpatient treatment was successful for 18.2% of the patients and inpatient treatment was successful for 56% of the patients.

3.3. Measurements

There were no significant differences in growth in neither height nor weight for height during the follow-up period. Children in the outpatient group showed a bend in the growth curve for height with a growth of −0.20 SD (SD = 0.42). They had a growth in weight of 0.19 SD (SD = 0.69), while those in the inpatient group grew 0.02 SD (SD = 0.30) in height and 0.14 SD (SD = 0.59) in weight.

We tried to determine a predictive factor for the success or relapse rate, but found no relation with the type of eating disorder, height and weight for height at presentation, age at presentation, additional problems, or pedagogic environment.

4. Discussion

From this study, we confirmed our hypothesis that hospitalization can be a therapeutic intervention in the treatment of behavioral feeding disorders. Short clinical intervention with a structured pedagogic environment and a behavioral treatment program proved to be a successful single treatment or continuation of failed outpatient treatment in behavioral feeding disorders.

In the literature, the effect of inpatient treatment was also proven for children with obesity; a cognitive behavioral non-diet approach was found to be promising, even though this program lasted for 14 months [25]. The

Table 2. Success and relapse rates.

Characteristics	Groups	
	Outpatients N = 11	Inpatients N = 25
Duration of treatment (days)	72	13
Initial success rate	2 (18.2%)	22 (88%)**
Relapse rate in follow up	0 (0%)	8 (32%)**
Final success rate	2 (18.2%)	14 (56%)*
Change in length after treatment in SD	−0.20 (0.4)	0.02 (0.3)
Change in weight for height after treatment in SD	0.19 (0.17)	0.14 (0.6)

*$p < 0.05$, students' t-test; **$p < 0.01$, students' t-test.

effect of the treatment is probably owing to temporary resetting of the pedagogic environment and guidance to the parents to continue this at home. The negative home situation is broken through and the parents and children are put in another direction. However, owing to the inability of the parents because of their inconsistency, this is unlikely to succeed in the home situation. Low success rates of outpatient treatment support this theory. Nevertheless, all the children return to their old home situations and the chances of falling back into old habits for both parents and children do exist, as is shown by the relapse rates.

Neither the type of feeding disorder nor the additional problems or the family structure from where the children came had any influence on the success of treatment or relapse rate. Children in our study group came from similar environments as those in the regional population. The main difference between our study group and the regional population could be that most of the parents in our study were inconsistent in applying appropriate behavioral contingencies during meals.

Our results oppose those of Singer, who found that extended hospitalization with a mean duration of 17 weeks was most successful [6]. This is probably owing to the fact that Singer's study group consisted of infants with a mean age of 5.4 months, while ours consisted of children with a mean age of 3.25 years. Goldstein *et al.* found data similar to our data, with an increase in weight during inpatient treatment of 15.9 days on an average [9]. However, this study focused on infants with a mean age of 8.4 months, which is younger than our study group.

In recent studies, behavioral feeding disorders are mostly treated in outpatient setting. Good results have been achieved with outpatient treatment, but the mean duration of treatment is usually longer than the inpatient treatment in our study.

There are some limitations to this retrospective study that need to be mentioned. The sample size of this study is small, therefore limiting the significance of our results. Hence, it may be possible that we did not find any predictive factors for failure of treatment and relapse after successful treatment. Second, children in both the groups were not randomized. The distribution between the groups was based on the severity of the feeding disorder, making it difficult to compare both the groups.

Even though there are limitations to this study, we are certain that it can be used in designing future treatment plans for behavioral feeding disorders. Even in a small sample like ours, it seems clear that behavioral feeding disorders are better treated in an inpatient rather than an outpatient setting, not only because the percentage of successful treatment is higher, but also because the duration of treatment is shorter. To prevent relapse and intervene if it occurred, it is wise to have a period of outpatient follow-up.

Obviously, in all the behavioral feeding disorders a behavioral component is present. However, we did not investigate that component, but only the parental approach and to place the child outside its comfort zone. Our study shows that the parental strategy plays a big contribution to the existence and persistence of these feeding disorders. When the parents learn how to cope with their child's feeding disorder, the need for direct investigation of the behavioral component disappears because the child starts to eat again. We did not investigate further implications of the behavioral component. Nevertheless, this is one of the first studies in which a hospital admission can serve as a pedagogic tool with medical guidance for a medical/behavioral problem. However, by looking at the favorable results, it is worth investigating it further.

5. Conclusion

Short clinical intervention in a pedagogic structured environment and a behavioral program is an effective treatment for resetting behavioral feeding disorders in children. Our study group showed that most of the parents in our study were inconsistent in applying appropriate behavioral contingencies during meals. With the clinically resetting of the pedagogic environment, disturbed eating patterns can be normalized. Herewith, general pediatricians have a powerful tool for resetting behavioral feeding disorders in an early or advanced stage.

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