Comparison of familial and psychological factors in groups of encopresis patients with constipation and without constipation

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The study aimed to evaluate the differences between groups of encopresis patients with constipation and without constipation. The Symptom Checklist-90-Revised, the COPE Questionnaire, the Relationship Scales Questionnaire, the McMaster Family Assessment Device and the Parenting Style Scale were used to evaluate, respectively, maternal psychiatric symptoms, coping abilities, attachment style, family functioning and children's perceptions of parenting behaviors. Psychiatric diagnoses were evaluated using the K-SADS. A higher level of maternal psychiatric symptoms, impaired role and affective involvement functioning of the family and less psychological autonomy were observed in the group of encopresis patients with constipation than in the group of encopresis patients without constipation. No significant differences were found between the groups in psychiatric comorbidities, maternal coping abilities and attachment style. The two groups had a similar pattern of comorbid psychiatric disorders and maternal psychological factors, although some familial factors—related mainly to parental authority—were differentiated in the encopresis with constipation group.

Key words: encopresis, constipation, family functioning, McMaster Family Assessment Device.

Encopresis is defined as both the voluntary and involuntary passage of feces into inappropriate places in a child who is at least 4 years old. It is defined after medical causes have been ruled out, according to ICD-10[1] and DSM-IV-TR[2]. It is a common childhood disorder in pediatric and psychiatric settings. The incidence has been reported to be about 3% in general outpatient clinics[3], and greater (4%) in developing countries[4].

The etiology and course of encopresis have been increasingly conceptualized from a broad biopsychosocial perspective, and many risk factors have been studied[5-6]. Among these, familial and maternal psychological factors have been mentioned. Studies evaluating the family environment have shown that families of children with encopresis have inadequate family functioning and show less expressiveness and poorer organization[7-8]. Some common factors, such as serious separation from the family[4,9], inappropriate or incorrect toilet training[10-11] and a difficult temperament in the child[12-13], have also been reported to affect the development of elimination disorders.

DSM-V defines two subtypes of encopresis: encopresis with constipation and overflow incontinence; and encopresis without constipation and overflow incontinence[14]. Despite the fact that encopresis is associated with psychosocial problems, there have been few publications that address the psychological factors that might differentiate the development, maintenance or treatment of encopresis with or without constipation in the pediatric population. Additionally, little empirical work has been reported regarding the differences in the family environment of patients having encopresis with or without constipation. Encopresis with constipation is

explained by using the model of functional constipation, which is a main disorder in ROME-III and is not necessarily associated with soiling[15]. Additionally, the etiology of encopresis without constipation is not clear, and less research has been done for this disorder than for constipation. In a recent report, von Gontrad[15] called for the integration of ROME-III criteria for functional gastrointestinal disorders into DSM-V for clinical and research purposes.

This study was planned to extend the existing literature concerning the role of family and maternal psychological factors as contributors to encopresis with and without constipation, based on current research separating encopresis with constipation from encopresis without constipation in etiology and treatment. Thus, the present study aims to assess maternal psychiatric symptoms, coping abilities, attachment style and family functioning, and the perception of children regarding the parenting behaviors of their parents in groups of encopresis patients with and without constipation. Due to the scarcity of previous studies examining maternal psychiatric symptoms, coping abilities, attachment patterns and parenting behaviors in the subtypes of encopresis with and without constipation, no a priori hypotheses were made.

Material and Methods

Participants

The study group consisted of 30 children with encopresis with constipation and 11 children with encopresis without constipation, and their mothers. Children with mental retardation, pervasive developmental disorders and other neurological disorders were excluded from the study. No medical causes of encopresis were identified in any children after physical examination and appropriate laboratory tests. The study group comprised forty-four children fulfilling the criteria and aged between 6-16 years old who were referred to the child and adolescent clinic in a tertiary pediatric hospital. After excluding three children with encopresis whose mothers could not complete the procedure, 41 children and their mothers remained. The study protocol was approved by the Institutional Review Board and parent consent/child assent was obtained.

Procedure

The study group was evaluated by the department of child and adolescent psychiatry and the gastroenterology unit of the department of pediatrics. Children and their mothers were interviewed using the Schedule for Affective Disorders and Schizophrenia for School-Age Children, Present and Lifetime Version (K-SADS-PL), with the interviews conducted by a child and adolescent psychiatrist, in order to diagnose encopresis and comorbid psychiatric disorders in the study group. Children with encopresis were defined to have constipation if they fulfilled the Questionnaire on Pediatric Gastrointestinal Symptoms, Rome III version (QPGS-RIII) diagnostic criteria[16] by having two or more of the six conditions ($\leq$ 2 defecations per week; $\geq$ 1 episode/s of fecal incontinence per week; retentive posturing or excessive volitional stool retention; history of painful or hard bowel movements; passage of large stools that clog the toilet; and detection of large fecal mass in the rectum by doctors) for at least two months. A reliability and validity study of this form for the Turkish population has been conducted[17]. If needed, plain abdominal graphy was used for the evaluation of constipation. The socioeconomic level of the families was determined by the Hollingshead-Redlich Scale[18]. Five socioeconomic status levels (1 = upper, 2 = upper middle, 3 = middle, 4 = lower middle, 5 = lower) are defined in this scale. Mothers were interviewed and requested to complete a Symptom Check List-90-Revised (SCL-90-R), COPE Questionnaire, Relationship Scales Questionnaire (RSQ) and McMaster Family Assessment Device (FAD) in order to assess, respectively, maternal psychiatric symptoms, maternal coping abilities, maternal attachment style and family functioning. A Parenting Style Scale (PSS) was filled out by children eight years of age or older.

Data Collection Form: The sociodemographic data, developmental and medical histories of the children and features of their encopresis were collected using a data collection form created by the investigators.

Schedule for Affective Disorders and Schizophrenia for School-Age Children, Present and Lifetime Version (K-SADS-PL): A reliability and validity study of the K-SADS-PL[19] for the Turkish population has been conducted[20]. The validity,

inter-rater reliability and test-retest reliability of the K-SADS-PL were found to be excellent for elimination disorders.

Symptom Check List-90-Revised (SCL-90-R): The SCL-90-R is a 90-item self-rating inventory in which each item is rated on a 5-point Likert scale, ranging from 0 (not at all) to 4 (extremely)[21]. It includes nine clinical subscales for somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism. The Global Severity Index (GSI) score is calculated by dividing the total score obtained from all items by 90. A GSI score higher than 1.00 is considered to indicate symptoms at the psychopathology level. A validity and reliability study of this scale has been performed in Turkey[22].

COPE Questionnaire: The COPE Questionnaire was developed to measure the different ways people have of responding in stressful situations[23]. It includes 60 items on 15 subscales that are scored on a 4-point Likert scale ranging from 1 (don't do this at all) to 4 (do this a lot). These subscales measure problem-focused coping, emotion-focused coping and less useful or avoidant coping responses. Problem-focused strategies include active coping, planning, restraint coping, seeking of instrumental social support and suppression of competing activities. Emotion-focused strategies include positive reinterpretation, turning to religion, coping through humor, acceptance and seeking of emotional social support. Less useful or avoidant responses include focusing on and venting of emotions, denial, behavioral disengagement, mental disengagement and drinking to cope. A reliability and validity study of this scale has been undertaken in Turkey[24].

Relationship Scales Questionnaire (RSQ): The RSQ was developed in order to measure adult attachment, and classifies it as secure, fearful, preoccupied or dismissive[25]. It consists of 30 items. Participants rate each item from 1 (not at all like me) to 7 (very much like me) on a 7-point Likert-type scale based on how they define themselves in close relationships. Each attachment style is calculated by adding up the ratings of the items related to a given attachment style and dividing that sum by the

Table I. Sociodemographic Characteristics of the Encopresis with Constipation and Encopresis without Constipation Groups

	Encopresis with constipation group N=11	Encopresis without constipation group N=30	Statistics
	Median (Range), years		
Age	9 (6-16)	9 (6-12)	$z = -0.889$ $p=0.374^{NS}$
Age of mothers	37.5 (24-45)	35.0 (28-46)	$z= -0.398$ $p=0.691^{NS}$
Education level of mothers	8.0 (5-15)	11.0 (5-15)	$z = -1.650$ $p=0.099^{NS}$
Age of fathers	41.0 (30-80)	40.0 (30-50)	$z = -0.349$ $p=0.727^{NS}$
Education level of fathers	8 (5-15)	11 (5-15)	$z = -1.195$ $p=0.232^{NS}$
	N (Percent)		
Gender			
Male	21 (70.0%)	8 (72.7%)	$\chi^2 = 0.029$ $p=1.00^{NS}$
Female	9 (30.0%)	3 (27.3%)	
Socioeconomic status			
Upper	4 (13.3%)	3 (27.3%)	$\chi^2 = 1.498$ $p=1.00^{NS}$
Upper middle	2 (6.7%)	1 (9.1%)	
Middle	8 (26.7%)	3 (27.3%)	
Lower middle	9 (30.0%)	2 (18.2%)	
Lower	7 (23.3%)	2 (18.2%)	

SD = Standard Deviation, NS = Not significant, $p > .05$.

Table II. SCL-90-R, COPE, RSQ, FAD and PSS Subscale Scores of the Encopresis with Constipation and Encopresis without Constipation Groups

	Encopresis with constipation group N=11		Encopresis without constipation group N=30		Statistics
	Median	(Range)	Median	(Range)	
SCL-90-R					
GSI	1.16	(0.04-2.50)	0.49	(0.01-1.31)	z= -2.439 p=0.015*
Somatization	1.54	(0.00- 2.67)	0.50	(0.00-1.67)	z= -2.229 p=0.026*
Obsessive-compulsive	1.65	(0.20-2.90)	0.60	(0.00-1.50)	z= -3.247 p=0.001**
Interpersonal sensitivity	1.11	(0.00-3.11)	0.55	(0.00-1.89)	z= -2.686 p=0.007**
Depression	1.31	(0.00-3.08)	0.69	(0.00-1.92)	z= -1.821 p=0.069^{NS}
Anxiety	0.75	(0.10-3.20)	0.30	(0.10-1.00)	z= -2.341 p=0.019*
Hostility	1.33	(0.00-3.17)	0.50	(0.00-1.17)	z= -2.434 p=0.015*
Phobic anxiety	0.43	(0.00-1.71)	0.14	(0.00-0.71)	z= -2.665 p=0.008**
Paranoid ideation	1.00	(0.00-2.50)	0.50	(0.00-1.83)	z= -2.509 p=0.012*
Psychoticism	0.50	(0.00-2.40)	0.20	(0.00-0.80)	z= -1.570 p=0.116^{NS}
COPE					
Problem-focused coping	56.00	(28.00-72.00)	61.00	(44.00-72.00)	z= -0.849 p=0.396^{NS}
Emotion-focused coping	54.50	(37.00-72.00)	56.00	(46.00-66.00)	z= -0.030 p=0.976^{NS}
Dysfunctional coping	37.00	(28.00-53.00)	36.00	(27.00-60.00)	z= -1.003 p=0.316^{NS}
FAD					
Problem-solving	2.08	(1.00-3.50)	2.17	(1.33-3.50)	z= -1.048 p=0.295^{NS}
Communication	2.05	(1.33-3.55)	1.78	(1.00-3.22)	z= -0.074 p=0.941^{NS}
Roles	2.19	(1.36-3.18)	1.55	(1.09-3.00)	z= -2.298 p=0.022*
Affective responsiveness	1.92	(1.00-3.75)	1.50	(1.00-3.66)	z= -0.781 p=0.435 ^{NS}
Affective involvement	2.28	(1.42-3.57)	1.85	(1.00-2.71)	z= -2.189 p=0.029*
Behavioral control	2.12	(1.00-3.22)	1.88	(1.22-3.00)	z= -0.236 p=0.814 ^{NS}
General functioning	2.00	(1.33-3.50)	1.75	(1.00-3.17)	z= -0.959 p=0.338 ^{NS}
PSS					
Acceptance/ involvement	30.50	(17.00- 36.00)	28.00	(18.00-35.00)	z= -0.832 p=0.405^{NS}
Strictness/ supervision	28.50	(21.00-32.00)	30.00	(17.00-32.00)	z= -0.265 p=0.791^{NS}
Psychological autonomy	21.00	(14.00-31.00)	27.00	(18.00-32.00)	z= -2.068 p=0.039*
	N	(percent)	N	(percent)	
RSQ					
Secure	9	(30.0%)	5	(45.5%)	χ^2 = 0.855 p=0.463^{NS}
Insecure	21	(70.0%)	6	(54.5%)	

SCL-90-R: Symptom Check List-90-Revised, GSI: Global Severity Index, COPE: COPE Questionnaire, RSQ: Relationship Scales Questionnaire, FAD: McMaster Family Assessment Device, PSS: Parenting Style Scale. * p< .05, ** p < .01, NS = Not significant, p > .05.

number of items in the subscale in question. The highest subscale score is also considered to indicate the attachment orientation of the respondent. A secure attachment style is related to cognition of self-worth, and others' availability and responsiveness when they are needed. A fearful attachment style is linked to a sense of unworthiness and the expectation of non-trusting and rejecting behaviors from others. Those with a preoccupied attachment style perceive themselves as unworthy, but others as positive and worthy. A dismissive attachment style is related to a perception of self-worth, but the expectation of non-trusting and rejecting behaviors from others. The construct validity of the RSQ's Turkish version was reported to be high; its test-retest reliability ranged between 0.54 and 0.78[26].

McMaster Family Assessment Device (FAD): The FAD was developed based on the McMaster model of family functioning (MMFF) and measures structural, organizational and transactional properties of the family[27]. The MMFF model has six dimensions: problem solving, communication, roles, affective responsiveness, affective involvement and behavior control. The FAD is a self-reporting questionnaire and includes 60 items related to the dimensions, with 6 items for problem-solving, 9 items for communication, 11 items for roles, 6 items for affective responsiveness, 7 items for affective involvement, 9 items for behavioral control and 12 items for general functioning. All subscales have an average score ranging from 1 to 4. Scores > 2.00 indicate problems in the related functioning of the family. A reliability and validity study of this scale was undertaken in Turkish families[28].

Parenting Style Scale (PSS): In order to evaluate the perceptions of children in the study and control groups regarding the parenting style of their parents, the PSS[29] was used. The PSS includes 26 items, which are grouped into three dimensions: acceptance/involvement, strictness/supervision and psychological autonomy. A validity and reliability study of this scale was performed in Turkey[30]. The test-retest reliability and internal consistency values of the dimensions were between .60 and .93 in elementary, high school and college student groups. The factor pattern of the PSS for the elementary and high school students was very similar to the original scale's factor pattern.

Statistics

Statistical analyses were performed using SPSS software version 18. The variables were investigated using visual (histograms, probability plots) and analytic (Shapiro-Wilk test) methods to determine whether or not they were normally distributed. Maternal age, SCL-90-R subscales other than anxiety, phobic anxiety and psychosis, SCL-90-R GSI scores, COPE emotion-focused strategies total scores, RSQ scores, the FAD subtests other than roles, and PSS scores other than strictness/supervision were normally distributed. The sample size of the encopresis with constipation group was 11, so we chose to use nonparametric tests to analyze the significance of the differences in normally distributed continuous variables. The Mann-Whitney U test was used to compare the median scores of two the groups. A chi-square test was conducted to examine the significance of the differences in variable frequencies between the groups. Fisher's exact test was used when more than 20% of the cells had an expected count of less than 5.

Results

Sociodemographic Results

There were 29 (70.7%) boys and 12 (29.3%) girls in the entire group of children studied. No significant differences in the age and gender of the children and the socioeconomic levels of the families were found between the encopresis with constipation and encopresis without constipation groups (Table I). The age and education levels of the parents in the two groups were not significantly different (Table I).

Clinical Characteristics

The lifetime and present rate of comorbid disorders in the two groups (encopresis with constipation; encopresis without constipation) were: enuresis (56.7%, n = 17; 45.5%, n = 5), attention deficit hyperactivity disorder (46.7%, n = 14; 45.5%, n = 5), oppositional defiant disorder (26.7%, n = 8; 36.4%, n = 4), anxiety disorders (10.0%, n = 3; 27.3%, n = 3), tic disorders (10.0%, n = 3; 0.0%, n = 0), major depression (6.7%, n = 2; 0.0%, n = 0) and conduct disorder (3.3%, n = 1; 0.0%, n = 0). There was at least one comorbid psychiatric disorder in 25 (83.3%) children in the encopresis with constipation group and in

9 (81.8%) children in the encopresis without constipation group. The comorbidity rate was not significantly different between the groups (χ^2 = .013, p = 1.00).

Maternal Psychiatric Symptoms, Coping Abilities, Attachment Style, Family Functioning and Parenting Style Results

The GSI score of the SCL-90-R was detected to be significantly higher in the encopresis with constipation group than in the encopresis without constipation group, pointing to more severe maternal psychiatric symptoms (Table I). Significantly higher FAD role and affective involvement subscale scores were also found in the encopresis with constipation group (Table II). No significant differences were found between the two groups in the mothers' scores on the other FAD, COPE and RSQ subscales. The PSS psychological autonomy subscale scores were found to be significantly different, with the encopresis with constipation group showing less psychological autonomy than the encopresis without constipation group (Table II). No significant differences were found between the two groups for other PSS subscale scores.

Discussion

This study aimed to compare groups of patients having encopresis with and without constipation in terms of familial and maternal psychological factors. According to the main findings of this study, these two groups have a similar pattern of comorbid psychiatric disorders and maternal psychological factors, although some familial and maternal factors (such as maternal psychiatric symptoms, the role and affective involvement functioning of the family and perceived psychological autonomy in children) have been differentiated in the encopresis with constipation group. It is believed that nonretentive encopresis, or encopresis without constipation, is seen as the manifestation of a psychological or behavioral problem[31]. Our results suggest that both subtypes of encopresis may be similar in having psychiatric components in their pathogenesis. This observation is also in accordance with the literature[32-33].

In various studies, constipation was frequently reported in children with encopresis[32,34]. Similary, constipation was present in 73.2% of the whole group, based on the ROME-III criteria in our sample. Encopresis is generally believed to be the result of chronic constipation in the majority of pediatric patients. However, encopresis without constipation can be seen in clinical practice. Studies on constipation and encopresis have shown that constipation is itself associated with behavioral problems in children, disturbances in parent-child relationships, and stressful events in families[35]. Factors related to constipation are also frequently cited in relation to encopresis[32,36]. Both functional constipation and encopresis are considered as main disorders in various studies[15,32]. Consequently, it becomes more important to understand the differences between these two subtypes of encopresis based on current knowledge indicating that the symptoms, etiology and treatment of encopresis with and without constipation are different [31,37].

In the present study, no differences were observed in the rate of psychiatric comorbidity in the groups of patients having encopresis with and without constipation. Similarly, Becker et al.[38] did not find a significant difference in the rate of comorbidity between encopresis with and without constipation. These two subtypes of encopresis have also presented with similarly high rates of additional psychological and behavioral disorders elsewhere in the literature [32,36-37]. These results suggest that it is not possible to differentiate between encopresis with and without constipation on the basis of psychological and behavioral disorders alone. In the present study, the encopresis with constipation group had a higher level of maternal psychiatric symptoms, less psychological autonomy and impaired role and affective involvement functioning of the family compared to the encopresis without constipation group. It can be suggested that inadequate role and affective involvement functioning of the family, more severe maternal psychiatric symptoms and less psychological autonomy are dynamically related to each other either as a result or a cause in the encopresis with constipation group. The differences between the two encopresis groups may be related to the additional effect of the family relations of children with constipation, such as the absence of parental rules, which points to the role functioning of the family. Amendola et al.[35] affirm that functional constipation

symptoms result from three problematic areas: relational, parental and within the child. They reported similar findings to this study (68% of the children lacked autonomy, and 84% of the children were without parental rules). The familial and psychological features differentiated in the encopresis with constipation group may even cause failure of the treatment of constipation, which consists of many approaches, such as constant dietary education, a detailed record of bowel activity, a sitting schedule and reinforcement. Constipation itself can be a major stress to the child and family, especially when the family is functionally insufficient. Amendola et al.[35] suggested retentive soiling as one possible sign of hidden depression in children. They found that modification of familial organization (making rules and equalizing family roles and powers) can be effective in avoiding recurrence of the symptoms of functional constipation. It has also been noted in the literature that family support, in addition to medical and behavioral management, can be a necessary component of the treatment of encopresis[39]. The results of this study made us question the necessity of routine screening of familial functioning in the encopresis with constipation subtype. Successful treatment results have been reported using an interactive parent-child family guidance intervention, which involved family members in psychologically based treatment following limited success of standard gastroenterologic interventions in the treatment of encopresis and chronic constipation[40].

The present study has various strengths as well as limitations. The evaluation of psychiatric diagnoses and constipation using structured interviews and ROME-III criteria in children with encopresis and assessment of maternal psychological factors and family functioning may be considered to constitute its strengths. Nevertheless, this study did not report any data from fathers, and did not include control groups of healthy children with and without constipation. Another limitation of this study is that it was carried out in a tertiary pediatric setting, which may limit the generalization of the findings. Additionally, the small sample size—especially that of the encopresis without constipation group—may diminish the statistical power of the results. Finally, as with all cross-sectional studies, it is not possible to understand whether the psychological factors found in the present study are the causes or the consequences of soiling.

In summary, the present study aimed to assess maternal psychiatric symptoms, coping abilities, attachment style, family functioning and the perception of children regarding the parenting behaviors of their parents in groups of patients having encopresis with or without constipation. An important finding of the present study was that, except in the areas of maternal psychiatric symptoms, the role and affective involvement functioning of the family and children's perceived psychological autonomy, the encopresis with constipation group did not differ from the encopresis without constipation group. We suggest that familial functioning—especially in relation to parental authority—may have an additional role in the etiology of encopresis with constipation and may differentiate the two subtypes of encopresis. Further research should be conducted to understand the possible familial and maternal differences between the two encopresis subtypes and the contributing effects of constipation.

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