Social and emotional impact of faecal incontinence after surgery for anorectal abnormalities

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Abstract

A significant proportion of children with anorectal malformations have long term problems with faecal continence. The psychological consequences of this chronic disability was assessed in 160 children and adolescents.

The prevalence of clinically significant emotional problems among the sample overall, as assessed by a diagnostic psychiatric interview (19%), parental assessment (27%), and child self report depressive scale (24%) was higher than expected relative to normative populations. With the exception of the young girls (6-11 years), the incontinent children and adolescents were not judged to be less well adjusted than those with good bowel control.

Treatment for anorectal malformations appears to be associated with an increased risk for behavioural and social problems, but this was not related to the level of continence. Parental factors and gender were significantly associated with outcome. These children and families would benefit from psychological evaluation and support especially during early childhood.

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Children with chronic disorders are at increased risk for behavioural and social problems, psychiatric disturbance,^{1,2} and impaired emotional adjustment.³ Even mild chronic disorders have been shown to increase a child's psychological vulnerability,⁴ and an association between physical and psychological disorders has also been demonstrated.⁵ Other research has suggested that there are no marked differences between children in several disease categories and comparable controls.^{6,7} Although a high proportion of children born with anorectal abnormalities have long term problems with faecal incontinence, little is known about the psychosocial consequences. Ditesheim and Templeton assessed 'quality of life' in relation to the success or failure of attaining faecal continence,⁸ and Ginn-Pease *et al* reported on the psychological adjustment of children with imperforate anus or abdominal wall defects.⁹

The aim of this study was to assess the emotional and social adjustment of children with anorectal malformations in relation to the level of continence achieved, and to assess whether the prevalence of behavioural and emotional disturbance increases during adolescence.

This paper constitutes the first in a series of reports and focuses on the question of whether children with faecal incontinence fare less well emotionally than those who achieve continence. Further reports will address the issues of how the children cope with this chronic disability and whether parental, sibling, and peer responses have an impact on the child or adolescents' functioning.

Patients and methods

The case notes of all patients who had their primary definitive surgery for anorectal anomalies performed at Great Ormond Street Children's Hospital (GOS) between 1974 and 1987 were reviewed to ascertain which fulfilled the criteria for our study. Eligibility criteria excluded children who did not undergo primary definitive surgery at GOS, those who were known to be developmentally delayed, and those with multiple handicaps, of which the anorectal malformation was only one component. Children currently living outside England and Wales were also excluded.

Altogether 223 patients aged 6-17 years were contacted by letter explaining the purpose of the study and requesting their participation; the patients comprised those who were still attending the hospital for medical or surgical follow up and those who had been discharged. Written consent was received from 160 families (72%); 52 families (23%) could not be located, and only 11 (5%) did not agree to participate.

The study sample comprised 90 boys and 70 girls (mean (SD) age 11.3 (3.4) years). Eighty one were aged between 6 and 11 years (designated as children) and 79 were aged between 12 and 17 (designated as adolescents).

Characteristics of the study sample are shown in table 1.

PROCEDURES AND INSTRUMENTS USED

The study was designed to include a clinical examination followed by separate psychosocial interviews with the parents and the child or adolescent. In addition, both the parents and the children were asked to complete standardised questionnaires. Teachers were asked to complete standardised behavioural questionnaires.

After a clinical examination the surgeon completed a standard form designed for the study. In addition to surgical and medical details this included a classification of the

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Table 1 Characteristics of the sample (n=160). Values are number (%) unless otherwise stated

Mean (SD) age in years	11.3 (3.42)
Range	6–17
Boys/girls	90/70
Family size	
Range	1–5
First born	77 (48)
Only child	16 (10)
One of twin	6 (4)
Family composition	
Both biological parents	123 (77)
Single parent	
Mother	18 (11)
Father	2 (1)
Mother/father substitute	7 (4)
Other (grandparent, adopted, fostered, etc)	8 (5)
Ethnic minority background	22 (14)
Social class	
Non-manual	81 (54)
Manual	52 (34)
Unemployed/not working	12 (8)
Armed forces	4 (3)
Other	2 (1)
Parental education	
No formal qualifications	
Mother	47 (31)
Father	59 (45)
CSE/'O' levels	
Mother	70 (47)
Father	40 (31)
'A' levels+	
Mother	33 (22)
Father	32 (24)

anorectal anomaly as high, intermediate, or low according to the Wingspread classification system,¹⁰ and a clinical scoring measure (Kelly score) that grades levels of faecal continence.¹¹ The total Kelly score ranges from 0 to 6, with a score of 5 or 6 equated with continence and scores of four or less equated with incontinence.

The patients with low anomalies will have had immediate definite surgery in the newborn period, while those with high and intermediate anomalies will have had a staged procedure starting with a colostomy in the newborn period followed by a pull-through procedure and closure of the colostomy within the first year of life. Many required repeat admissions and/or further surgical procedures.

Clinical data

Altogether 59% of the subjects had high and intermediate anomalies and 41% low. As expected the number of boys with high and intermediate anomalies was greater than that for girls (70:24) whereas proportionately more girls had low anomalies (46:20). The relationship between the level of the anomaly and total Kelly scores for the study sample is shown in table 2. An analysis of variance (total Kelly score by sex) revealed a significant effect of gender (F 3.94, df 1, p<0.05), with the boys having a lower (worse) mean total Kelly score.

Table 2 Relationship between level of lesion and total Kelly score. Values are number (%)

	Level of lesion		
	Low	Intermediate	High
Total Kelly score			
5 or 6	45 (30)	5 (3)	6 (4)
≤4	17 (12)	12 (8)	63 (43)
Total	62 (42)	17 (11)	69 (47)

Total sample with total Kelly score 148 (no total Kelly score for eight cases; four cases had a permanent colostomy).

When, however, the level of the lesion was controlled for, the effect of gender was no longer significant (F 2.44, df 1, p=0.12).

Measures of emotional and behavioural disturbance

In order to measure a number of domains of child or adolescent functioning and to include measures from multiple perspectives, five measures of child or adolescent emotional and behavioural adjustment were used.

All assessments were carried out by a psychologist experienced in working with children and their families. The parent(s) were interviewed using a semistructured interview especially designed for the study. The interview included detailed questions about the child's continence level, and where appropriate methods of managing and coping with current and past bowel problems at home, at school, and socially. Questions also focused on the child's social life and personal relationships. The parents were also questioned about psychological and emotional symptoms in the child. Items from semistructured interviews,^{12,13} which have been shown to be reliable and valid instruments for assessing psychiatric disturbance were used to structure this part of the interview. Both parents were asked to complete the 30 item general health questionnaire,¹⁴ to assess psychiatric morbidity, and the mothers were asked to complete a marital rating measure.¹⁵

The interview with the child or adolescent was similarly structured and included a standardised form of psychiatric interview modelled on the Child Assessment Schedule (CAS),¹⁶ and semistructured interviews.^{13,17} The CAS elicits information concerning symptoms reflective of *Diagnostic and Statistical Manual of Mental Disorders*, third edition, revised (DSM-III-R) categories of psychopathology in young people and has been shown to differentiate depressed, anxious, and conduct disordered young people. Data supportive of the reliability and validity of the CAS are well established.^{18–20} (When the child was interviewed their state of continence was known.)

While the patient was being interviewed the parents were asked to complete the newly revised Child Behaviour Checklist (CBCL).²¹ This is a parent rated measure of children's behaviour. The checklist yields a total behaviour problem score that is calculated by summing the scores (0, 1, or 2) from the 112 behaviour problem items. In addition two broad band subscales, referred to as internalising and externalising symptom scales, can be calculated. Internalising symptoms are those associated with neurotic or overcontrolled tendencies (social withdrawal, depression, anxiety) whereas externalising symptoms are those associated with conduct problems or undercontrolled behaviours (antisocial, aggressive, delinquent).

Separate scoring scales and normative data are provided for boys and girls as well as for children in the age ranges of 6–11 and 12–17

Table 3 Psychiatric diagnosis. Values are number (%)

Psychological disorder		
Dubious/mild	16 (10)	
Definite/moderate	30 (19)	
Total	46/157 (29)	
Continent (total Kelly score 5 or 6)		
Dubious/mild	4 (7)	
Definite/moderate	8 (15)	
Total	12/55 (22)	
Incontinent (total Kelly score ≤ 4)		
Dubious/mild	10 (11)	
Definite/moderate	21 (23)	
Total	31/90 (34)	
Specific learning disorders	11 (7)	20(13)
Borderline intellectual functioning*	9 (6)	
Academic problems†	7 (4)	

No total Kelly scores for 12 cases; three children not interviewed.

*Two cases had physical handicaps severe enough to interfere with academic progress.

†One child had a cerebrovascular accident after an accidental injury.

years. As recommended, T scores of ≥ 60 (corresponding to the 82nd centile) were used as the cut off points for defining levels of clinical significance.²¹

While the parents were being interviewed the children were asked to complete a depression self rating scale (DSRS).²² This is an 18 item self report screening measure for affective disorders in childhood and adolescence. A cut off of 11, recently recommended by Fundudis *et al*, was used.²³ (The interviews with the child or adolescent were conducted blind to the results of the self report inventories.)

The children's teachers were asked to complete the Teacher's Report Form (TRF),²⁴ which is modelled on the CBCL with additional items appropriate for teachers. (The teachers were told that the child had been admitted to GOS in early childhood, but were not necessarily aware of the nature of the child's medical problem.)

The study was approved by the ethical committee of GOS.

Results

Analyses were conducted to compare the psychological adjustment of the study group overall. The sample was also divided into two groups based on their level of continence as rated by the Kelly scoring method (total Kelly score 5 or 6: continent ($n=56$), total Kelly score ≤ 4 : incontinent ($n=92$). A total Kelly score was not available for eight children and four had permanent colostomies.

In order to compare our findings with existing normative data for the CBCL and TRF the sample was subdivided by sex and age (6–11 and 12–17 years). Three parents (2%) did not complete the CBCL, eight teachers (5%) did not return the TRF, and six adolescents were no longer at school (4%); three children were not interviewed, and three did not complete the DSRS.

(1) INTERVIEW DATA

Forty six of the 157 children and adolescents interviewed (29%) were judged as having some psychiatric disorder based on the diagnostic interview, ranging in severity from 'dubious or mild' in 16 (10%) to definite or moderate in 30

(19%). This prevalence of 19% is significantly higher than a one year prevalence rate of 10% in the general child population (<0.001),²⁵ but is similar to that found in children with chronic disorders.

Eleven children and adolescents (7%) met the criteria for the DSM-III-R diagnoses of specific developmental disorders (for example, developmental arithmetic and reading disorders), with a further nine (6%) diagnosed as being of borderline intellectual functioning (that is, IQ range 71–84). In addition, three children (one boy and two girls) and four adolescent boys were having academic problems at school (4%) (table 3).

Thirty two (20%) were diagnosed as having neurotic (emotional) disorders, with a high proportion of these children and adolescents having anxiety disorders (20/32, 63%). Five children (3%) fulfilled the criteria for attention deficit hyperactivity disorder.

Analysis of the type and frequency of psychiatric diagnoses in relation to the total Kelly score did not reveal significant differences between the continent and incontinent groups (table 4).

There was no relationship between the presence of a psychiatric disorder and parental mental state or the marital relationship.

(2) CBCL QUESTIONNAIRE DATA

Thirty nine of the children and adolescents (27%) had CBCL total behaviour problem T scores in the clinical range for psychopathology. This prevalence is significantly higher ($p<0.01$) than expected based on the 82nd centile norms (18%) or when compared with the 90th centile norm (17% *v* 10%) used in previous research of children with chronic medical disorders using an earlier version of the CBCL. Thirty one per cent had internalising scores in the clinical range for psychopathology while the proportion with externalising scores in the clinical range was similar to the norms (19%). There were no significant differences between the continent and incontinent groups.

The mean total problem T scores of the young boys, both continent and incontinent, were significantly higher than the normative population (incontinent: 55, 95% confidence interval (CI) 51 to 59, t 2.57, df 27, $p<0.02$; continent: 57, 95% CI 51 to 63, t 2.27, df 15,

Table 4 Psychiatric disorder* based on diagnostic interview in relation to total Kelly score. Values are number (%)

Age (years)	Continent (total Kelly score 5 or 6)	Incontinent (total Kelly score ≤ 4)
6–11		
Boys	1/17 (6)	6/29 (21)
Girls	2/17 (12)	2/14 (14)
12–17		
Boys	3/10 (30)	9/28 (32)
Girls	2/11 (18)	4/19 (21)
Totals	8/55 (15)	21/90 (23)

No total Kelly score for 12 cases; three children not interviewed.

*Disorder judged as present when severity rated as definite (social impairment minimal) or moderate (social impairment of a degree as to significantly interfere with everyday life).

Table 5 CBCL T scores and number of children in clinical range for behavioural problems

Age (years)	Continent (total Kelly score 5 or 6)			Incontinent (total Kelly score ≤4)		
	No	Mean (SD) T scores	No (%) in clinical range*	No	Mean (SD) T scores	No (%) in clinical range*
6-11						
Boys	16	56.75 (11.92)†	7 (44)	28	55.12 (10.52)†	9 (32)
Girls	17	50.71 (6.29)	1 (6)	15	52.67 (8.96)	4 (27)
12-17						
Boys	9	54.11 (10.65)	3 (33)	29	49.62 (12.36)	7 (24)
Girls	12	53.00 (12.65)	4 (33)	19	51.84 (11.30)	4 (21)
Total	54		15 (28)	91		24 (26)

Norm for mean T score: 50 (SD=10, SE 0.4).
No total Kelly scores for 12 cases; no CBCL for three cases.
*Norm for proportion in clinical range: 18% (82nd centile).
†Mean T scores significantly higher than norms.

p<0.05) (table 5). Their mean internalising T scores were also significantly greater than the norms (incontinent: 57, 95% CI 55 to 60, *t* 3.86, df 27, p<0.001; continent: 59, 95% CI 53 to 61, *t* 2.87, df 16, p<0.05). The mean internalising and externalising T scores for the rest of the sample were close to the norms.
There was no association between the CBCL total problem scores and the total Kelly scores (*r*=0.028).

(3) TRF QUESTIONNAIRE DATA

Based on the teachers' ratings, 17% of the sample overall were in the clinical range for psychopathology on the total problem scale. This proportion is very similar to the normative population. These findings are consistent with the parental assessment in that the teachers tended to rate a higher proportion of the young boys and adolescents with bowel control (20%) as showing more behavioural disorder than those who were incontinent (15%), but differ from the parental ratings since a lower proportion of the sample overall had scores in the clinical range. In addition, the parents and teachers both rated the young incontinent girls as being less well adjusted than those with control (CBCL: incontinent 27%, continent 6%; TRF: incontinent 18%, continent 6%). The overall proportion of children with TRF internalising scores (22%) and externalising scores (14%) in the range for psychopathology, was similar to the norms.

The TRF total problem mean T scores of the incontinent young girls (52, 95% CI 48 to 57) were significantly greater than those of the girls with control (43.5, 95% CI 40 to 47, *t* 2.90, df 26, p=0.007) (table 6). The

Table 6 TRF T scores and number of children in clinical range for behavioural problems

Age (years)	Continent (total Kelly score 5 or 6)			Incontinent (total Kelly score ≤4)		
	No	Mean (SD) T scores	No (%) in clinical range*	No	Mean (SD) T scores	No (%) in clinical range*
6-11						
Boys	17	48.24 (11.22)	4 (24)	28	49.50 (9.31)	4 (14)
Girls	17	43.53 (7.78)†	1 (6)	11	52.27 (7.80)†	2 (18)
12-17						
Boys	8	56.63 (8.35)	3 (38)	28	49.62 (12.36)	5 (18)
Girls	9	50.89 (13.35)	2 (22)	17	50.59 (9.51)	2 (12)
Total	51		10 (20)	84		13 (15)

Norm for mean T score: 50 (SD=10, SE 0.5/0.6).
No total Kelly scores for 12 cases; no TRF for 14 cases.
*Norm for proportion in clinical range: 18% (82nd centile).
†Difference between continent and incontinent groups significant at p<0.01.

difference between their internalising T scores was also significant (incontinent: 53, 95% CI 49 to 57; continent: 45, 95% CI 42 to 48, *t* 3.23, df 26, p=0.003). Although there were significant differences between the two groups of young girls in the study sample, the scores obtained by the young girls with good bowel control were significantly lower than the norms.
The mean internalising and externalising T scores for the rest of the sample, with the exception of the adolescent boys, were close to the norms.

There was a significant inverse association between the total Kelly score and the TRF total problem scores (*r*=-0.202; *F* 5.68 (1,133), p<0.02).

(4) DEPRESSION SELF RATING SCALE

Any child who might have had difficulty reading or understanding the questions had each item on the questionnaire read out to them, and in most cases the younger children were questioned to see if they fully understood the more complex questions. As a precaution, the data from those who were diagnosed as being of borderline intellectual functioning were excluded from the analyses.

The DSRS revealed that for the sample overall 24% (35/148) of the children and adolescents rated themselves as showing depressive symptoms, with the children (30%) rating themselves as having more symptoms than the adolescents (17%). The difference between the age groups approached significance (χ^2 3.44, df 1, p=0.06).

When the samples were divided by sex and continence level (total Kelly score), this revealed a tendency for higher scores among the incontinent children and adolescents compared with those who were continent (table 7).
There was a significant association between the self report depression scale and parent rated internalising behaviour problems (p<0.005). There was no association with parental mental health.

MULTIVARIATE STATISTICAL ANALYSIS

Initial univariate analyses indicated that the variables most strongly associated with outcome on the parent and/or the teacher rated assessments were the age and sex of the child and for the TRF the total Kelly score, as well as parental factors such as the marital

Table 7 DSRS in relation to levels of continence (total Kelly score). Values are number (%)

Age (years)	Continent (total Kelly score 5 or 6)	Incontinent (total Kelly score ≤4)
6-11		
Boys	4/17 (24)	9/28 (32)
Girls	5/17 (29)	5/12 (42)
12-17		
Boys	1/9 (11)	4/27 (15)
Girls	1/11 (9)	5/17 (29)
Total	11/54 (20)	23/84 (27)

No total Kelly score for 10 cases. Those diagnosed as borderline intellectual functioning excluded (n=9). Data for three cases missing.

Table 8 Multiple regression analyses dependent variable CBCL total problem scores

	Total R ²	F (df)	Significance of F	Coefficient B (SE b)
Dependent variable				
CBCL	0.169	5.57 (5,137)	p=0.0001	
Predictor variables				
Sex				-4.95 (2.91)*
Age group (6-11, 12-17 years)				-5.05 (2.86)*
Kelly score				1.19 (0.82)
'Family' score				-7.61 (1.81)***
Family 'education' score				-3.73 (1.74)**

*p<0.10, **p<0.04, ***p<0.0001.

relationship, mental health scores, and educational levels. Multiple regression analyses were conducted to estimate the unique and combined contributions of these explanatory variables to child and adolescent adjustment as measured by the CBCL and TRF total problem scores. Two composite family variables were created to overcome possible interdependence among the parental variables. Firstly, a composite score of the parental mental health scores and the marital relationship scores (family); secondly, the parental educational levels (education). The 'family' score was constructed by converting each of the variables so that they were equally weighted with values ranging from 0-30 (high scores corresponding to a 'good' score), and then summing their standardised scores. Similarly, the 'education' variable was constructed by converting the parental education level variables to values ranging from 0-30 and summing the standardised scores. To overcome the skewed distribution of the TRF scores a square root transformation was carried out.

To predict CBCL behavioural problems, a general linear model was fitted with five predictor variables. The total Kelly score, the child's gender and age group (6-11, 12-17 years) and the two composite family variables. The strongest independent predictor of outcome was the composite family variable, which explained 10% of the variance in child and adolescent adjustment (B -7.61 (SE 1.81), p<0.0001). The education variable contributed an additional 3% of the variance (B -3.73 (SE 1.74), p<0.04). The level of continence score was not predictive (table 8). This model suggests that higher (good) scores on the family variable best predict a lower prevalence of behaviour problems, with girls predicted to have lower scores than the boys, and the adolescents lower scores than the children. A model testing for group differences revealed no significant interaction, indicating

that the family variable did not have a differential effect on the continent *v* incontinent children and adolescents.

To predict behavioural problems as reported by teachers, the transformed TRF total problem scores were used as the dependent variable and the model was fitted with the five predictor variables listed above. The model, which is summarised in table 9, accounted for 15% of the variance in teacher rated child and adolescent adjustment, with gender (B -1.21 (SE 0.40), p<0.003) and parental educational levels (B -0.57 (SE 0.24), p<0.02) independently contributing to the equation. This model suggests that better parental educational levels best predict a lower prevalence of behaviour problems with the girls predicted to have significantly lower scores than the boys. When these factors were accounted for, the total Kelly score was no longer an important contributor to outcome.

Discussion

The findings from this study have shown that contrary to our expectations, the incontinent children and adolescents were not less well adjusted than those with bowel control. In fact, when family factors were accounted for, no association was found between the level of faecal incontinence as measured by the total Kelly score and measures of psychological adjustment. Nevertheless, the prevalence of clinically significant emotional problems among the sample overall as assessed by the psychiatric interview, the parental assessment, and the child depression scale, was higher than expected in relation to normative populations, with a high proportion of the children showing internalising problems, as well as reporting depressive symptoms.

The only statistically significant difference between the continent and incontinent children and adolescents was among the young girls. The teachers rated the young incontinent girls as showing significantly more behaviour and internalising problems than the young girls with bowel control. Evidence suggesting some support for these findings came from two sources. Firstly, the young incontinent girls tended to have higher scores on the DSRS than the continent girls. Secondly, the parents' report of behaviour and internalising problems (CBCL) also indicated a trend towards a higher prevalence of disorder among the incontinent young girls compared with the continent young girls.

As expected, outcome based on the different methods of assessment varied. For example, the parents reported high levels of behaviour problems among the continent and incontinent young boys, but these findings did not concur with the teachers' report. There was, however, consistency in their reporting of increased internalising symptoms among the young boys (CBCL 41%; TRF 33%). Additionally, the psychiatric interview identified a high rate of emotional and behavioural disturbance among the adolescent boys, both continent and incontinent (continent: 30%

Table 9 Multiple regression analyses dependent variable TRF total problem scores

	Total R ²	F (df)	Significance of F	Coefficient B (SE b)
Dependent variable				
SQR/TRF	0.151	4.60 (5,129)	p=0.0007	
Predictor variables				
Sex				-1.21 (0.40)**
Age group (6-11, 12-17 years)				0.47 (0.39)
Total Kelly score				-0.12 (0.11)
'Family' score				-0.29 (0.25)
Family 'education' score				-0.57 (0.24)*

*p<0.02, **p<0.003.

SQR: square root transformation of TRF scores.

and incontinent: 32%, increasing to continent: 30% and incontinent: 46% when cases with 'mild' problems were included). On the other hand, based on the teachers' report, the adolescents who had achieved continence tended to be more disturbed than the incontinent adolescent boys (continent 38%; incontinent 18%). Differences between the assessment measures, which have also been reported in many recent studies,^{26 27} reflect not only the differing perspectives of the respondents, but the checklists measure somewhat different aspects of psychosocial functioning than the interview methods. Moreover, although the checklists have sound psychometric properties, compared with semistructured interviews, they have the disadvantage of not being suitable for probing symptoms, and may also be more sensitive to parental educational levels. An additional factor, which is common to studies of children with chronic medical problems, is, that with the possible exception of the teachers, all concerned were aware of the nature of the child's disability and whether the child was continent or incontinent.

Contrary to our predictions those who were still incontinent by the time they reached adolescence were not, as a group, more emotionally disturbed than those with bowel control. We hypothesised that for children with chronic faecal incontinence, adolescence would be a particularly stressful time, since the social problems associated with their disability as well as those associated with the physical and emotional changes of puberty and emerging sexuality, would be intensified. Moreover, limited control over a sensitive area of physical functioning together with the need to adjust emotionally to the adult implications of their disability, were likely to interfere with emotional development. In addition, Ditesheim and Templeton's study showed that the 'quality of life' of incontinent children over the age of 10 was less good than for younger children.⁸ Although the data from the psychiatric interview indicated a relatively high rate of psychological distress among the incontinent adolescents (40% including cases rated as mild), this was not significantly different from that among the continent adolescents (24%). Moreover, based on parent and teacher behaviour ratings and the self report questionnaire, there was no evidence of an increased prevalence of behavioural and emotional disturbance among this sample of incontinent adolescents when compared with those who were continent. This suggests that the majority of the incontinent adolescents in this study had come to terms with their disability. Over time, the chronic nature of their problem appeared to have stimulated psychologically protective factors such as positive coping strategies. Moreover the parents of these children may have come to accept from early on that, due to the 'severity' of the condition, their child would never be able to achieve normal bowel control. Consequently parental sensitivity to the problems the child may have had to cope with could act as a protective factor if parental functioning itself was not adversely affected.

The variables with the strongest explanatory power for the differences on the CBCL total problem scores were parental mental health and the marital relationship, but these variables were not important explanatory variables for outcome as measured by the psychiatric interview, the TRF, or the DSRS. It is possible that parents with higher levels of psychological distress and/or lower levels of marital satisfaction are more likely to report behaviour problems, or these children may indeed be more behaviourally maladjusted, which in itself affects marital satisfaction and parental health. It is also possible that better functioning families are more sensitive to their child's condition, symptoms, and distress.

The explanatory variable common to outcome as measured by both the CBCL and TRF was the level of parental education, especially the fathers. The better the parents' education the lower the children's behaviour problem scores. With this exception, the findings indicated no major effect of family background factors such as social class, birth position, and number of siblings.

Another unexpected finding was that, based on a number of the assessment measures, a higher proportion of the study sample had scores indicating psychopathology when compared with normative populations. These findings, which are comparable with other studies of children with chronic medical disorders, suggest that parents of children who are born with anorectal anomalies overcompensate for their child's early life threatening problems. As we found in a longitudinal study of children who underwent major neonatal surgery,²⁸ mothers tended to be ineffective and inconsistent in their responses to their children's behaviour and this is known to be detrimental to future emotional and behavioural adjustment.²⁹

In conclusion, in the care of children with chronic physical problems, one aim is to try to minimise the relationship between physical and emotional difficulties. Because faecal incontinence is socially unacceptable, and clinical experience has indicated a link between physical and emotional difficulties, the principal aim of this study was to assess whether there was a relationship between persistent faecal incontinence and emotional adjustment. The findings have shown that at the time of interview, the incontinent children and adolescents, with the possible exception of the young girls, were not more emotionally disturbed than those with bowel control.

The findings from this study cannot, however, account for the important concerns about cause and effect, because the data were cross sectional. Assessing whether faecal incontinence produces effects on the child's psychological adjustment or whether the child's emotional adjustment affects their ability to achieve socially acceptable levels of bowel control can only be addressed in a longitudinal study. In addition, it is known that certain characteristics of a child, and of his or her parents or family, may have positive or negative effects on a child's psychological

adjustment. Among this sample of young people higher parental educational levels were associated with lower levels of behavioural difficulties, whereas poor parental mental health and low marital satisfaction were strongly related to higher levels of behavioural disturbance. None of these parental factors, however, were related to levels of faecal incontinence. Although we hypothesised that chronic faecal incontinence would have a negative effect on family life, and the interview data certainly highlighted the very considerable problems the parents and children had to contend with, the cross sectional nature of the data do not allow us to elucidate whether faecal incontinence produces an alteration in parental mental health and marital satisfaction, or whether these parental factors affect the child's desire to achieve social control of his or her bowels, or whether both are simultaneously or reciprocally related.

Despite these reservations, this study, which is the first to examine in detail the relationship between faecal incontinence and emotional adjustment in a large group of children treated for anorectal anomalies, offers encouragement to the children and their families, but it also indicates that these children are at risk for difficulties with psychosocial adjustment. Outcome and compliance with treatment may be enhanced if, from an early age, psychological evaluation of the child and experienced advice and guidance for the families, regardless of the level of faecal incontinence, becomes an integral part of their continuing care.

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