

## FUNCTIONAL NONRETENTIVE FECAL SOILING AND STRESSFUL LIFE EVENTS

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### ABSTRACT

**Introduction:** Functional non-retentive fecal soiling (FNRFS), or encopresis without constipation, is a common problem in pediatric age. FNRFS is associated with high levels of distress for both children and parents and with emotional disorders in about 30%-50% of affected children. This study aimed to evaluate stressors on a sample of children with FNRFS comparing to a group of typical development children (TDC).

**Methods:** 154 subjects participated in the study: 56 FNRFS children (37 males; mean age 10.87 years  $\pm$  1.68); 98 TDC (65 males; mean age 11.3 years  $\pm$  1.85). All participants were evaluated for the presence of stressful events (LCU) using the Coddington Life Events Scales (CLES).

**Results:** Both groups were similar for age ( $p = 0.155$ ), and gender ( $p = 0.885$ ).

Children with FNRFS do not show a significant difference in the prevalence of stressful events than the control group (35.85% vs. 30.83%; CI95% -9.9363% to 20.5490%; Chi-square = 0.402;  $p = 0, 0.5258$ ).

**Conclusions:** These data suggest that FNRFS is a condition independent of stress factors. In fact, it itself represents a stress factor that can negatively influence the correct psychological and neuropsychological development in children.

**Keywords:** Functional nonretentive fecal soiling, FNRFS, soiling, encopresis, Coddington Life Events Scales, life adverse events.

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### Introduction

Functional non-retentive fecal soiling (FNRFS), or encopresis without constipation, is a common problem in pediatric age<sup>(1)</sup>. FNRFS is associated with high levels of distress for both children and parents and with emotional disorders in about 30%-50% of affected children<sup>(2)</sup>. According to the classification proposed by DSM-5th<sup>(3)</sup>, two main types of encopresis are distinguished: encopresis with or without constipation. Encopresis is defined as both voluntary and involuntary passage of feces in inappropriate places in a 4-year-old or older child after organic causes have been ruled out.

Although epidemiological data are still contrasting and the estimated prevalence depending on the definition used, FNRFS tends to affects up to 3% of children older than 4 years<sup>(2,4,5)</sup>.

However, males seem to be affected more frequently than females and daytime FNRFS is more frequent than nocturnal FNRFS, which is most often due to organic causes<sup>(6)</sup>.

Clinically, children affected by FNRFS have normal intestinal movements and stool consistency, infrequent abdominal pain, normal colon transit and no stool mass<sup>(5)</sup>.

A link between FNRFS and behavioral disorders has been reported in the literature. In this regard, the researchers traced the origin of the disease to a psychiatric disorder and considered that there is a link between the symptom and an altered parent-child relationship. These evidences have been shown in the evaluation scales<sup>(6)</sup>, based on the detection of pathological results achieved by the mothers of the affected children, similar to many reports focused on other neurodevelopmental disorders<sup>(7-13)</sup>.

## Methods

154 subjects participated in the study: 56 FNRFS children (37 males and 19 females; mean age 10.87 years  $\pm$  1.68); 98 TDC (65 males; mean age 11.3 years  $\pm$  1.85). FNRFS was diagnosed according to the DSM-5 criteria (3). All participants were evaluated for the presence of stressful events (LCU) using the Coddington Life Events Scales (CLES).

All participants were Caucasian, homogeneous for socioeconomic status and were recruited from the same urban area.

Exclusion criteria were the following: cognitive disability (IQ <70), borderline intellectual functioning (IQ ranging between 71 and 84), genetic syndromes (i.e.: Down syndrome, Prader-Willi syndrome, fragile X syndrome), psychiatric (i.e.: autism, schizophrenia, mood disorders, ADHD) and neurologic disorders (i.e.: primary headaches, epilepsy, sleep disorders), primary nocturnal enuresis, learning disabilities, obesity and other metabolic diseases, and psychotropic drugs treatment<sup>(14-36)</sup>.

All evaluations were performed after written informed consent obtained by parents of both groups, and when appropriate directly by children (if at least 8 years old).

### *Coddington Life Events Scales (CLES)*

In order to verify and evaluate stressful life events (LEs), the validated Italian version of Coddington Life Events Scales (CLES) was used. The CLES measures the appearance of LEs with a questionnaire that requires for each item that describes a specific type of LE also the number of times that this event occurred in the last 3 months, 4-6 previous months, 7-9 previous months or 10-12 previous months<sup>(37)</sup>.

The frequency of appearance is used to calculate the Life Change Unit (LCU) index, which shows the amount of stress linked to that life event and how long ago it happened.

We computed the LCU scores provided from the assessments of teachers, pediatricians and child neuropsychiatrists.

A total LCU score was obtained for each respondent as a weighted sum of all the LCU scores (range of LCUs for one LE: 5-216). Two different types of life events were classified: desirable (e.g. "Graduating from high school") vs. undesirable events (e.g. "Divorce of parents) and family-related (e.g. "Loss of a job of your father or mother") vs. extra-family events (e.g. "Going on the first date"). Each life event was classified accordingly into one of the two categories in

each typology, except for nine which were classified in only one life event typology (e.g. "Being hospitalized for illness or injury" was undesirable but was not classified in the 'family' typology because it was neutral with regard to that particular typology)<sup>(37)</sup>.

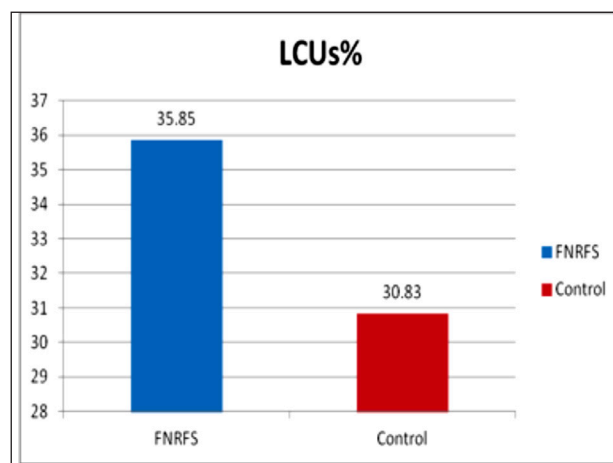
### *Statistical Analysis*

To detect differences among the two groups t-student's and Chi-square were applied.  $p < 0.05$  was identified as statistically significant value. Statistical analysis were performed with MedCalc software.

## Results

The two groups were similar for age ( $p = 0.155$ ), and gender distribution ( $p = 0.885$ ).

FNRFS children did not show a significant difference in the prevalence of stressful events than the control group (35.85% vs. 30.83%; CI95% -9.9363% to 20.5490%; Chi-square = 0.402;  $p = 0.5258$ ) (Graph 1).



**Graph 1:** shows the mean percentages differences between FNRFS and Control group for Life Change Units (LCUs). No differences were between the two groups.

## Discussion

In past decades anecdotal empirical researches have deeply analyzed and then confirmed the relationship between adverse life events in the past and / or in the last twelve months and the onset of psychopathological disorders in childhood and adolescence, although without any scientific supports.

Therefore, psychiatric/psychological distress disorder are currently regarded as a secondary to FNRFS and or as its comorbidities. Undoubtedly, the FNRFS can have significant consequences both on the affected child due to social and personal difficulties and on the impact on the emotional state, social development and

self-esteem, and on the whole family for managing a child with such difficulties. But the effects of stressful life events cannot be considered leading the diagnostic process and the management of a psychosomatic diagnosis a priori.

FNRFS can be a devastating and debilitating experience for children and adults, it can induce feelings of guilt, shame, embarrassment, a sense of difference from others and low self-esteem. On the other hand, FNRFS seems to occur as main comorbidity with other psychiatric disorders such as externalizing problems, oppositional defiant and ADHD, whereas not necessarily all children and adolescents who experience adverse life events will develop a psychopathological disorder.

Generally the response to each event is subjective and individual and depends on risk factors and protective factors. The pathogenesis of this relationship is not well studied although we could hypothesize the role of many different neurotransmitters and the involvement of the hypothalamic-pituitary-thyroid axis and orexins pathway as suggested in many other disorders<sup>(38-50)</sup>.

In conclusion, children affected by FNRFS have not a higher prevalence of stressful events later in life compared to normal subjects. These data suggest that FNRFS is a condition independent of stress factors. In fact, it itself represents a stress factor that can negatively influence the correct psychological and neuropsychological development in children.

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