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# LIFE EVENTS AND PRIMARY MONOSYMPTOMATIC NOCTURNAL ENURESIS: A PEDIATRIC PILOT STUDY

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**ABSTRACT**

***Introduction**: The association between primary monosymptomatic nocturnal enuresis (PMNE) and behavioral disorders was highlighted frequently, suggesting psychiatric origin. On the other hand, there is no difference between the incidence of mental disorders in children with PMNE and controls, although the psychological genesis could provide additional secondary forms, in which the child might react to stressful events with the resumption of involuntary urination at night, with a possible alteration of bowel control due to a high vulnerability to stressors.*

*The purpose of this study is assessing the stressful events of life in a sample of children with PMNE.*

***Materials and methods**: 56 subjects with PMNE, (37 males and 19 females) (mean 10.87 years; SD ± 1.68) were recruited consecutively. All subjects were evaluated for the presence of stressful events (ICU) with test Coddington Life Events Scales (CLES). The control group consists of 98 typically developing children (65 males, 33 females) (p = 0.855) (mean 11.3 years; SD ± 1.85; p = 0.594).*

***Results**: Individuals with enuresis do not show a significant difference in the prevalence of stressful events than the control group (42.85% vs 41.83%; Chi-square = 0.002; p = 0,963) (table 1).*

***Conclusions**: These results for the first time show that PMNE can be regarded as an independent state by stress factors, suggesting that it itself represents a stress factor that can affect the proper psychological and neuropsychological development in children.*

***Keywords**: primary monosymptomatic nocturnal enuresis, PMNE; Coddington Life Events Scales, life adverse events.*

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## Introduction

The physiology of micturition is a complex system that involves three important organs, whose proper functionality is a key requirement: autonomic nervous system (SNA), kidneys and bladder.

The bladder control allows the alternation of long and slow phases of filling and emptying phases of short, in opposition with each other for reflex mechanism, with a rate of filling of the bladder of approximately 50 ml of urine/hour[1-5].

In pediatric age, Primary Monosymptomatic Nocturnal Enuresis (PMNE) occurs when the mic-

turition control falls due to one of the following three different factors: nocturnal polyuria; overactivity of the detrusor muscle; low arousability rate[1-5].

In the past decades, the association between PMNE and behavioral disorders was highlighted, leading researchers to believe that the disease may be due to a psychiatric origin, and linking the symptom to an altered parent-child relationship, based on the detection of pathological results achieved, both by mothers of children affected, in rating scales[1-5].

Subsequent studies have shown conflicting data with this theory, up to its complete abandonment. In fact, there is no difference between the incidence of mental disorders in children with PMNE and controls, although the psychological genesis could be envisaged more for secondary forms, in which the child would react to stressful events with the resumption of involuntary urination at night, with a possible alteration of the sphincter control linked to a 'high vulnerability to stressors[1-5].

The aim of the present study is evaluating the stressful life events in a sample of children affected by PMNE.

## Materials and methods

According to DSM-5 criteria, 56 subjects affected by PMNE, (37 males and 19 females) (mean age 10.87; SD ± 1.68) were consecutively recruited.

All subjects were evaluated for the presence of stressful life events (LCU) with tests Coddington Life Events Scales (CLES). All subjects in both groups were recruited within the same urban area, all Caucasian and homogeneous for socioeconomic level.

Exclusion criteria were the following: mental retardation (IQ <70), borderline intellectual functioning, genetic syndromes (eg. Down syndrome, Prader-Willi syndrome, fragile X syndrome), hypothyroidism, metabolic and celiac diseases, psychiatric disorders (autism, schizophrenia, mood disorders, ADHD), movement and neuromuscular disorders, epilepsy, obesity, primary headache, sleep related breathing disorders, sleep troubles and pharmachological and/or complementary treatment[6-44].

All evaluations were performed after informed consent from the parents, and when appropriate also by children. Control group was composed by 98 typical developing healthy children (65 males, 33 females) (p = 0.855) (mean age 11.3; SD ± 1.85; p = 0.594).

### *Coddington life events scales (CLES)*

Stressful LEs were measured using the Coddington Life Events Scales (CLES), which measure the occurrence of 53 LEs. Respondents indicate for each item describing a specific LE and the number of times the event has occurred in the last 3 months, 4-6 months earlier, 7-9 months earlier, or 10-12 months earlier. The frequency of occurrence is taken into account in the calculation of Life Change Units (LCUs) which also reflect the amount of stress inherent to the event and how long ago it happened. We used the original LCUs, which were obtained from ratings provided by teachers, paediatricians, and child psychiatrists. A total LCU score can be calculated for each respondent as a weighted sum of all the LCU scores (range of LCUs for one LE: 5-216).

We used the Italian version of CLES. Life events were classified according to two different typologies: 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 LE was classified accordingly into one of the two categories in each typology, except nine which were classified in only one LE 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).

### *Statistical analysis*

The t-Student’s test and Chi-square tests were applied to determine the differences among two groups. P values <0.05 were considered statistically significant. For statistical analysis it used the software STATISTICA (data analysis software system, version 6, StatSoft, Inc. (2001).

## Results

The subjects with enuresis do not show a significant difference in the prevalence of stressful events than the control group (42.85% vs. 41.83%; Chi-square = 0.002; p = 0,963) (table 1).

| | PMNE (n=56) | Controls (n=98) | *p* |
|---|---|---|---|
| **Age** | 10.87 ± 1.68 | 11.3 ± 1.85 | 0.594 |
| **Sex (M/F)** | 37/19 | 65/33 | 0.855 |
| **z-BMI** | 0.71 ± 0.12 | 0.69 ± 0.18 | 0.459 |
| **Nocturnal enuresis frequency/week** | 7 | - | - |
| **Stressful events %** | 42.85 | 41.83 | 0.963 |

**Table 1**: shows comparisons among means and/or percentages among children affected by primary monosymptomatic nocturnal enuresi (PMNE) and healthy controls for age, sex dstribution, z-BMI, and stressful events. t-Test and Chi-square test analysis were performed when appropriated.
$p<0.05$ values were considered as statistical significant.

## Discussion

In the past decades scientific reports have extensively analyzed and confirmed the association between adverse life events during the past and/or during the last twelve months and the onset of psychopathological disorders in both preschool and school aged children and adolescents[45-50].

Therefore, psychiatric/psychological distress disorder is currently regarded more and more as a secondary to PMNE and or as its comorbidities. Undoubtedly, PMNE can determine both social and personal difficulties in children affected with significant impact on emotional state, social development and self-esteem, as well as on the whole family[45-50].

PMNE may be a devastating experience for children and young adults, inducing feelings of guilt, shame, embarrassment, sense of difference from others and a low self-esteem[45-50].

PMNE children and adolescents tend to show pathological scores in the outsourcing stairs (aggression, attention deficit, which results in low academic performance), with a lower incidence of the internalization disorders than healthy controls[45-50].

On the other hand, PMNE seems to occur as main comorbidity with other psychiatric disorders such as bipolar disorder, oppositional defiant and ADHD. However, not all children and adolescents who have experienced adverse life events will develop a psychopathological disorder. The event response is subjective and individual and depends on the combination of risk factors and protective factors. Pathogenesis of this relationship is not well studied although we could speculate the role of many different neurotransmitters[45-50].

In conclusion, children affected by PMNE have not a higher prevalence of stressful events later in life compared to normal subjects. These results for the first time show that the PMNE may be considered as an independent state by stressors, suggesting that it itself represents a stressor that can affect the correct psychological and neuropsychological development in children.

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