

## RISK FACTORS FOR REFRACTORY NOCTURNAL ENURESIS AMONG EGYPTIAN CHILDREN

### Hypothesis / aims of study

The aim of this prospective study is to identify the risk factors that may have an impact on the etiology of refractory primary nocturnal enuresis among Egyptian children.

### Study design, materials and methods

We included all children presented at our department in the period between January 2010 and December 2013 who complained of primary nocturnal enuresis and who didn't respond to behavioral, medical and/or alarm treatment (for at least 6 months) or relapsed after treatment end. All patients were evaluated through detailed history, routine physical examination with complete ENT and neurological examination. Patients completed 3 days bladder diary and nocturnal enuresis chart for 2 weeks. All patients were investigated by urine analysis and culture, pelviabdominal ultrasound, x-ray spine, uroflometry and cystometry. Patient's weight, height and body mass index (BMI) were calculated. BMI percentiles were determined based on data from the Egyptian Growth Reference Charts for both girls and boys. All patients filled a specially designed questionnaire consisted of several questions about suspected risk factors, including sleep pattern, gastrointestinal disorders, family history of enuresis, family disturbance, social class and average monthly income of the parents.

### Results

Three-hundred sixty-two patients (198 male and 164 female) participated in this study, mean age was  $11.9 \pm 3.1$  (range: 6-18 years). Based on bladder diary data 118 (32.6%) of patients had non-monosymptomatic nocturnal enuresis in the form of frequency (36%), urgency (27%), daytime urinary incontinence (22.3%) or voiding difficulties (14.6%). The mean maximum voided volume was  $284.4 \pm 157.7$  ml (range: 140-570 ml), 132 (36.5%) child had a small bladder capacity and 124 (34.2%) showed detrusor overactivity during cystometry. The mean BMI was  $21.3 \pm 4.5$  kg/m<sup>2</sup> (range: 10.5-34.1 kg/m<sup>2</sup>) and mean BMI percentile was  $73.5 \pm 26.1\%$  (range: 3-97%), out of them 178 patients (49.2%) were obese and overweight. Interrupted uroflow pattern was present in 30 (8.3%) patient. Two-hundred thirty-six patients (65.7%) reported positive family history of nocturnal enuresis. Deep sleep was present in (60.8%) of patients, in addition low social class and financial support was highly evident among patients (78% had low income and 20.4% had lower middle income according to World Bank Classification). On the other hand upper airway obstruction and family disturbances were present in (7%) and (5%) of patients respectively.

### Interpretation of results:

It seems that the underlying pathogenesis of refractory nocturnal enuresis is complex and multifactorial. Although there are well-known risk factors that are encountered in this challenging condition such as small bladder capacity, detrusor overactivity, sleep disorders and family history of enuresis. Poverty, low social level and obesity are new factors that are evident in our patients and associated with higher rate of enuresis.

### Concluding message

We recommend that children with refractory nocturnal enuresis should undergo a meticulous evaluation and every child should be individualized to obviate the associated risk factors in each patient in order to modify and improve behavioral therapy and to prevent relapse after cure. In addition, further large-sized population studies are warranted to identify other risk factors and to confirm our findings.

### Disclosures

**Funding:** None **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** Tanta Faculty of Medicine ethical Committee **Helsinki:** Yes **Informed Consent:** Yes