

## A LONGITUDINAL STUDY OF CHILDREN WITH ENURESIS

### Hypothesis / aims of study

Nocturnal Enuresis refers to the inability to control the bladder once asleep, with enuresis in children being the second most common disorder after allergies. The goal of this longitudinal study was to follow enuretic children and understand how they approached and managed their symptoms of enuresis. Furthermore, in this study, we aimed to determine how enuretic children deterred enuresis, the associated factors that led to their dryness, and the treatment practices and methods their parents utilized to achieve dryness.

### Study design, materials and methods

The participants of this prospective cohort study were between the ages of six and twelve and were confirmed to have primary enuresis after being chosen from the Taiwan Bedwetting Epidemiological Investigation in 2004. After five and a half years of long-term follow up, we calculated the ratio of the number of participants that still had enuresis to those that had achieved dryness and collected information regarding their treatment and prevention practices against enuresis. The Chi-square and Fisher's exact tests were used to determine whether the participants that still had enuresis and those that had achieved dryness differed significantly between their basic characteristics and daily practices in coping with enuresis. At the same time, McNemar Test was run to compare whether the treatment practices that these enuretic children utilized before and after 2004 changed significantly. Afterwards, Kaplan-Meier survival analysis was used to determine whether the amount of time the participants needed to achieve dryness was related to the degree of enuresis severity and the difficulty in awakening during sleep and whether these two factors differ significantly. Lastly, Cox proportional-hazard regression model was used to investigate the main factors that were affecting the ability of the participants to achieve dryness. All statistical analyses in this study were done with SPSS 15.0 software, and a p value less than 0.05 was considered statistically significant.

### Results

There were initially a total of 560 children diagnosed with primary enuresis participating in the study; after five and a half years, 408 of them were successfully contacted. Of all the remaining participants, 380 children (93.1%) had achieved dryness and their average age was  $9.9 \pm 1.8$  years. The basic characteristics of the enuretic children and those that had achieved dryness did not differ when they first enrolled in the study. The most common method through which parents controlled for their child's enuresis was limiting water intake before sleep (42.3%). Other methods included regularly waking their children to use the restroom during the night (26.8%), medication (9.3%), and punishment (0.8%). Moreover, as the age of their child increased, more parents not only limit water intake before bed, but also seek medical attention for their child, especially those with severe enuresis. Using the Kaplan-Meier survival analysis, it was found that age was negatively correlated with the number of persistent bedwetting, but those children that were heavy sleepers and suffered from severe enuresis were unlikely to improve even with age ( $p < 0.005$ ). Controlling for gender, age, enuresis severity, and 'heavy sleepers' through Cox proportional-hazard regression model, it was found that young female children with mild enuresis or children that were not heavy sleepers had a much higher probability to achieve dryness.

### Interpretation of results

Most parents still approached enuresis by limiting their children's water intake before bed. However, if enuresis continues to worsen as their children mature, they will consider medical intervention. Therefore in general, parents believed that enuresis will go away by itself as their children mature, and so the younger the child, the less likely the parents are to seek treatment.

### Concluding message

This study found that children who bedwetting often or were deep sleepers had a lower probability of overcoming enuresis, but if they were of female sex or younger in age, statistically speaking, they had a much higher probability to achieve dryness in a timely manner. Older children who had not seen improvement in achieving dryness often warrant additional attention from their parents who are worried that their children may have certain physical illnesses that are preventing them from achieving dryness. In this case, these parents were more likely to seek medical attention for their children.

### Disclosures

**Funding:** NONE **Clinical Trial:** No **Subjects:** HUMAN **Ethics Committee:** Institutional Review Board of the Changhua Christian Hospital **Helsinki:** Yes **Informed Consent:** Yes