Proceedings of International Conference on Scientific Research in Natural and Social Sciences
Hosted online from Toronto, Canada.
Date: 5th October, 2024
ISSN: 2835-5326 **Website:** econferenceseries.com

ETIOLOGIES AND EFFECTIVENESS OF THERAPY FOR NOCTURNAL ENURESIS IN CHILDREN

Saodatkhon Salikhova[1,2]
[1]PhD., Alfraganus University,
[2]Tashkent Pediatric Medical Institute

Annotation. Enuresis is a common and possibly underestimated condition. While 5-10% of school-aged children suffer from the condition, a lack of background knowledge may impede timely child-adapted and successful therapy. Currently, nocturnal enuresis is generally considered a multifactorial disease associated with a complex interaction of somatic, psychosocial, and environmental factors. This work studied the possible etiological factors of nocturnal enuresis and effectiveness of alarm therapy. The study showed that monosymptomatic nocturnal enuresis is more common in male children with positive family history of NE pointing to the possible hereditary factor in its pathogenesis. Bedwetting can be caused by a variety of reasons, including physiological and behavioral. Alarm plus desmopressin may reduce the number of wet nights a week compared with desmopressin alone.

Keywords: Enuresis, nocturnal enuresis, EEG, alarm therapy, desmopressin.

Introduction.

Enuresis is a common health problem in children, occurring in around 10% of five-year-old and 5% of ten-year-old [1]. Regardless of the multiple possible causes, enuresis affects the child's development [2,3]. Nocturnal enuresis, also known as nightly bedwetting, is a widespread disorder affecting 10-16% of 7-year-old children worldwide. Nocturnal enuresis (NE) is highly heritable, but its genetic determinants remain unknown [4,5]. NE is not diagnosed in children younger than 5 years, and treatment may be inappropriate for children younger than 7 years [6].

NE is a common and distressing developmental disease, which may cause various degrees of psychosocial stress and impairment to self-esteem in affected children as well as agitation to their parents or caregivers [7]. Furthermore, nocturnal enuresis can result in sadness, social maladjustments, and poor sleep quality because it frequently negatively impacts a child's performance and self-image [8]. Individual quality of life, social life, emotional stability, and psychosocial health can all be

significantly impacted by these comorbidities [9]. Actually, compared to their peers who do not experience nocturnal enuresis, juvenile patients with this condition have a higher prevalence of neuropsychiatric problems, including social anxiety, panic disorder, school phobia, depression, compulsive behaviors, and separation anxiety. These findings have been documented in the literature [10].

These days, nocturnal enuresis is mostly understood to be a multifaceted illness resulting from a complicated interplay of physical, psychological, and environmental components [11]. Numerous theories have been put forth to explain the onset and progression of NE [12]. These include hereditary aberration, abnormal antidiuretic hormone secretion during sleep, abnormal sleep patterns, bladder dysfunction, problems with arousal, neuropsychological disorders, and delays in brain maturation [13].

Primary NE may be either monosymptomatic nocturnal enuresis (MNE) with normal daytime voiding patterns or non-monosymptomatic NE caused by overactive bladder and presented by daytime wetting, urinary frequency, urgency, hesitancy and interrupted stream with variable-sized wet patches, repeated lower urinary or genital pain, and awakening after wetting [14].

According to the diagnostic criteria of the International Children's Continence Society, nocturnal enuresis without additional lower urinary tract symptoms or a history of bladder dysfunction can be diagnosed as nocturnal enuresis [15]. Based on clinical onset, NE can be divided into two forms: primary and secondary [16]. Primary nocturnal enuresis is defined as no period of urinary continence for more than 6 months, and secondary NE is defined as a prior period of urinary continence for more than 6 months [17].

Decreased nocturnal vasopressin (VP) secretion is a consequence and not the cause of enuresis as bladder distension is a potent stimulator of VP secretion and bladder emptying by enuresis may be an inhibitor of VP secretion [18].

In addition, alarm therapy is considered the first treatment modality of choice for enuresis with almost 50% cure rates are in the long term [19]. Cooperation and compliance from parents and children are the cornerstones of the effectiveness of alarm therapy [20].

Purpose. To study the possible primary monosymptomatic nocturnal enuresis etiologies and effectiveness of alarm therapy.

Methods. The present study was conducted on 20 primary MNE children (12 boys, 8 girls), aged 6–12 years (8.6 ± 2.1) recruited from the outpatient clinics of the Neurology Department, Alfraganus University Hospital, started from June 2024 till the end of September 2024, Tashkent, Uzbekistan. The bedwetting frequencies were 2–5/week. Eight patients (40%) had positive family history of NE (3 had history of an affected parent and 5 had an affected siblings). According to the study, male children with a positive family history of NE are more likely to experience MNE, suggesting a potential hereditary component in the etiology of the condition.

Exclusion criteria included children with non-MNE, secondary nocturnal enuresis, mental disorders, and psychiatric problems, epilepsy. NE cases due to organic neurological or urological causes were also excluded which were attained by neurological and urological examinations, urine analysis, and abdominal ultrasound.

Results. One of the main provoking factors of nocturnal enuresis was acute or prolonged psychological trauma (fear, conflicts between parents, divorce, birth of the next child). At the same time, there was a history of pathologic changes in the ante- and perinatal periods (premature birth, fetal hypoxia, acute and chronic maternal diseases).

Neurological examination of all children diagnosed with nocturnal enuresis revealed signs of minimal brain dysfunction (MBD) of varying severity: mild irritability (15%), impaired coordination, nausea in transport (30%), increased tendon reflexes and anisoreflexia (45%), headache (50%), attention deficit and hyperactivity (75%). According to the degree of clinical severity, enuresis in children was divided into 3 groups: 8 cases of mild form (40%), 9 cases of moderate severity (45%) and 3 cases of severe form (15%) were observed in children.

We performed EEG (30 minutes) for all children. The results of EEG of biological brain activity in children with enuresis there were revealed signs of MBD. In 13 examined children (65%) the main rhythm was not fully formed, low amplitude waves, on the contrary, in 5 children (25 %), alpha in the networks of occipital area there was an increase in the amplitude of the rhythm. Paroxysmal appearance of theta waves was observed in 7 (35%) children.

Eleven children with NE had previously undergone a desmopressin trial; four had a partial response, reducing the frequency of enuresis by approximately 50%, five had a near complete response for more than three months, but the response was drug-

dependent and enuresis rapidly returned when the drug was stopped and 2 had sluggish or no response. The incidence of spina bifida occulta (SBO) was 20% in patients with no discernible difference. Three children with nocturnal enuresis SBO were among those who responded sluggishly to desmopressin, and three had no previous treatment trials.

At night, mothers woke the child every 3 hours (at 1:00, 3:00 and 5:00) and took her/his to the toilet during a month. Alarm plus desmopressin may reduce the number of wet nights a week compared with desmopressin alone.

Conclusion. Nocturnal enuresis is a common urinary disorder in children, the prolonged course of which can interfere with socialization and cause anxiety for children and their families. Bedwetting can be caused by a variety of reasons, including physiological and behavioral. In children with enuresis the predominance of excitation processes over inhibition processes in the central nervous system was noted. As a result of electroneurophysiological examinations, it was found that the basic rhythm is not fully formed, and the excitability of the brain is increased. Weakness of inhibitory mechanisms, caused by past pathologies of the nervous system, suggests a violation of the system of volitional control of urination. Therefore, we recommend referral if primary monosymptomatic nocturnal enuresis persists at age 6-7 years. Behavioral therapy including fluid intake modification, bladder training, and motivational therapy is benign with positive results. Conditioned response to alarm cues for enuresis has proven to be the most effective treatment modality, and pharmacologic therapy with desmopressin has demonstrated significant results with minimal side effects. None of the methods of treatment does not give a 100% response, so a combined therapy, tailored to the individual characteristics of the child and family, appears to be the most appropriate solution to the problem of primary nocturnal enuresis.

Literature.

1. Yu B, Chang N, Lu Y, Ma H, Liu N, Guo Q. Effect of DRD4 receptor -616 C/G polymorphism on brain structure and functional connectivity density in pediatric primary nocturnal enuresis patients. Sci Rep 2017; 7:1226.

2. Jiawen Dang, Zhanghua Tang Pathogenesis and brain functional imaging in nocturnal enuresis: A review. Exp Biol Med (Maywood). 2021 Jul; 246(13): 1483–1490. doi: 10.1177/1535370221997363
3. Mills JN. Diurnal rhythm in urine flow. J Physiol 1951; 113:528–36
4. Riccabona M. [Evaluation and management of enuresis. An update]. Urologe A 2010; 49:861–9;
5. Wang M, Zhang A, Qin Z, Xu S, Ban S, Zhang J, Ma J, Du X. Abnormal neural responses to emotional stimuli in children with primary monosymptomatic nocturnal enuresis. Eur Child Adolesc Psychiatry 2019; 28:949–56
6. Khedr EM, Abo-Elfetoh N, Elbeh KA, Baky AA, Gamal RM, El Hammady D, Korashy F. Transcranial magnetic stimulation identifies cortical excitability changes in monosymptomatic nocturnal enuresis. Neurophysiol Clin 2015; 45:151–8
7. Balat A, Parlak M, Balci SO, Gogebakan B, Buyukcelik M, Col N, Kul S, Tinaztepe K. Increased potassium excretion in children with monosymptomatic nocturnal enuresis: could it be related to Kir 4.1-KCNJ10 gene polymorphism? Turk J Pediatr 2020; 62:208–14
8. Salehi B, Yousefichaijan P, Rafeei M, Mostajeran M. The relationship between child anxiety related disorders and primary nocturnal enuresis. Iran J Psychiatry Behav Sci 2016; 10:e4462.
9. von Gontard A, Schaumburg H, Hollmann E, Eiberg H, Rittig S. The genetics of enuresis: a review. J Urol 2001; 166:2438–43
10. Dhondt K, Baert E, Van Herzeele C, Raes A, Groen LA, Hoebeke P, Vande Walle J. Sleep fragmentation and increased periodic limb movements are more common in children with nocturnal enuresis. Acta Paediatr 2014; 103:e268-72
11. 45. Van Herzeele C, Dhondt K, Roels SP, Raes A, Hoebeke P, Groen LA, Vande Walle J. Desmopressin (melt) therapy in children with monosymptomatic nocturnal enuresis and nocturnal polyuria results in improved neuropsychological functioning and sleep. Pediatr Nephrol 2016; 31:1477–84
12. Eray S, Tekcan D, Baran Y. More anxious or more shy? Examining the social anxiety levels of adolescents with primary enuresis nocturna: a controlled study. J Pediatr Urol 2019; 15:343.e1–e5

13. Van Herzeele C, De Bruyne P, De Bruyne E, Walle JV. Challenging factors for enuresis treatment: psychological problems and non-adherence. J Pediatr Urol 2015; 11:308–13

14. Van Herzeele C, Vande Walle J. Incontinence and psychological problems in children: a common central nervous pathway? Pediatr Nephrol 2016; 31:689–92

15. Neveus T. Diagnosis and management of nocturnal enuresis. Curr Opin Pediatr 2009; 21:199–202

16. Dossche L, Walle JV, Van Herzeele C. The pathophysiology of monosymptomatic nocturnal enuresis with special emphasis on the circadian rhythm of renal physiology. Eur J Pediatr 2016; 175:747–54

17. Yu B, Sun H, Ma H, Peng M, Kong F, Meng F, Liu N, Guo Q. Aberrant whole-brain functional connectivity and intelligence structure in children with primary nocturnal enuresis. PLoS One 2013; 8:e51924.

18. Wang M, Zhang A, Zhang J, Lu H, Xu S, Qin Z, Ma J, Du X. Morphometric magnetic resonance imaging study in children with primary monosymptomatic nocturnal enuresis. Front Pediatr 2018; 6:103.

19. Yu B, Huang M, Zhang X, Ma H, Peng M, Guo Q. Noninvasive imaging of brain oxygen metabolism in children with primary nocturnal enuresis during natural sleep. Hum Brain Mapp 2017; 38:2532–9

20. Advances in the management of primary monosymptomatic nocturnal enuresis in children. Jain S, Bhatt GC. Paediatr Int Child Health. 2016;36:7–14.