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Review Article

Review on Primary Nocturnal Enuresis with special emphasis on Nonpharmacological treatment

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ABSTRACT

Nocturnal enuresis or bedwetting is the most common type of urinary incontinence in children. It has significant psychological effects on both the child and the family. Enuresis nocturna is defined as the inability to hold urine during the night in children who have completed toilet training. It is termed as being "primary" if no continence has ever been achieved or "secondary if it follows at least 6 months of dry nights. The aim of this review was to assemble the pathophysiological background and general information about nocturnal enuresis.

Keywords: Nocturnal Enuresis, Incontinence, Pediatric, Review, Treatment

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INTRODUCTION

Enuresis is defined as the voluntary or involuntary wetting of clothes or bedding with urine for a period of at least 3 consecutive months in children older than 5 years of age. The generally accepted definition, suggested by the American Pediatric Academy, is the involuntary wetting of clothes or bedding by urine during the daytime or nighttime. Nocturnal enuresis is more commonly observed in children. It may negatively affect the child's psychosocial development as well as interfere with the development of self-confidence and the ability to socialize.

Epidemiology:

While many theories have been put forward, the exact etiology of enuresis is still not clearly understood. It is thought that many combined and separate factors may lead to the development of enuresis. The etiology of nocturnal enuresis is multifactorial and is seen more frequently in girls. It is observed in more than 15% - 20% of children by the age of 5, which decreases to 1%- 2% by the age of 17. The spontaneous recovery rate is reported to be 14% per year. A positive family history is reported in many children. One study reported that the presence of enuresis in children of sufferers is as high as 77%. It has also been reported that children of parents who did not suffer from enuresis have a 15% risk of developing enuresis, with this rate increasing to 44% if one parent previously suffered from enuresis. When children with enuresis and those without were compared, family history was found to be positive in 48.5% (227/468) and 19.4% (1,246/6,421), respectively.

Three main factors in the Pathopysiology of Enuresis

High Nocturnal urine Production

Due to the discordance between nocturnal urine production and bladder capacity, the bladder may easily fill at night, leading to the awakening of the child for urination or in children with trouble awakening, incontinence. Under normal conditions, nocturnal vasopressin secretion is higher

than in the daytime. This leads to 50% less urine production during the night.

Additionally, inadequate secretion of the antidiuretic hormone (ADH), which also leads to the production of more urine, has been seen in these children. The frequency of this is thought to be around 2 out of 3 children.

Nocturnal Low Bladder Capacity or Increased Detrusor Activity

Recently, the Koff hypothesis has been used to attempt to explain the mechanisms of dysfunction in enuresis. Taking into account this hypothesis, researchers in one study found that patients with primary nocturnal enuresis (PNE) have a functional bladder capacity corresponding to 70% of the expected capacity. An increase in bladder wall thickness was also found with ultrasonography of the same patients. In another study of children with PNE, electroencephalography (EMG) and cystometry records demonstrated that bladder contractions could not be inhibited in 30%- 32% of enuretic children, and that this lead to their enuresis.

Arousal Disorder

Enuresis may be more correctly analyzed as a problem with awakening from sleep. This problem with awakening has been a focus point in enuresis. In normal children, when the bladder reaches maximum capacity, there is a sudden urge for urination that does not occur correctly in enuretic children. The exact cause behind this mechanism is not known, although some researchers suggest that chronic over-stimulation leads to downregulation of the voiding center.

Classification of Nocturnal Enuresis:

The ICCS classifies enuresis as primary or secondary. Most children with nocturnal enuresis fall into the primary group. Children who have at least 6 consecutive months of normal urinary control followed by commencement of enuresis are considered to have secondary enuresis, which is generally associated with underlying pathologies.

Nocturnal enuresis can be separated into two types

Primary Nocturnal Enuresis

Children without a period of 6 consecutive months of nighttime urinary control. This is the most common form.

Secondary Nocturnal Enuresis

Children with a period of 6 consecutive months of nighttime urinary control before incontinence. Enuresis in this group is associated with organic or psychological causes.

Childhood nocturnal enuresis may also be classified as monosymptomatic or non-monosymptomatic.

While children with monosymptomatic nocturnal enuresis (MNE) do not have any daytime symptoms, children with non-monosymptomatic nocturnal enuresis present with urge, frequency, or incontinence due to enuresis. Patients with nighttime wetting plus urge, incontinence, and frequency are considered to have polysymptomatic nocturnal enuresis. More than 80% of patients with enuresis are monosymptomatic. Although it is reported that 25% of patients with PNE are monosymptomatic, the rate may be higher due to the low reporting of daytime symptoms by patients or their parents.

Nonparmacological Treatment

Urotherapy

First-line treatment involves simple behavioral changes such as carrying the child to the toilet at night or awakening him or her for urination, along with daily motivation and exercises aimed at increasing bladder capacity. In children, non-surgical and non-pharmacological methods that correct voiding habits must be the backbone of any treatment.

Standard urotherapy involves educating families regarding enuresis and its treatment, offering suggestions for voiding patterns and frequency, limiting fluid intake, and treating constipation when present. The early diagnosis and treatment of constipation not only improves enuresis, but untreated constipation may also lead to treatment refractory enuresis.

Limitation of Fluid Intake

Although limiting fluid intake is routinely advised to all patients with enuresis, its efficiency has not been proven. Similarly, avoidance of drinks with a diuretic effect (such as those containing caffeine) is advised, although the effect of this has also

not been investigated.

Bedwetting Alarms

This treatment modality is based on conditioning. It is especially effective in children with difficulty awakening. This modality works by teaching or conditioning the child to awake for urination before bedwetting occurs. Alarm treatment can also be defined as a training program designed to increase night-time bladder capacity. Alarm treatment is effective in MNE and should be the first treatment choice in children under 8 years of age with adequate family support and no nocturnal polyuria.

Alarm therapy teaches children to hold their urine during sleep and awake for urination. It is also the first-line treatment for PMNE. There are many types of alarms. Bed pads, bed bells, and oscillators that vibrate when wet have all been shown to have similar effects. Bed pads are placed on the child's bed and give increasing severity of stimulation (sound, vibration etc.) as they come in contact with urine. Their effect must be evaluated after a period of at least 6 - 8 weeks of use, and alarm therapy must be continued for at least 14 dry nights before being discontinued. Treatment success rates are reported to be between 65 - 75%, although 10 - 30% of families are also reported to discontinue treatment on their own.

CONCLUSION

Nocturnal enuresis is a common problem that has multifaceted effects on both the child and the family. Due to multiple etiologic factors, nocturnal enuresis is still not clearly defined. Nonpharmacological treatment plays a major role in children.

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