

# Risk factors of nocturnal enuresis

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## ABSTRACT

Nocturnal enuresis is defined as the involuntary loss of urine at night, in the absence of organic (physical) disease such as urinary tract infection or detrusor over activity, at an age when a child could reasonably be expected to be dry (by consensus, at a developmental age of five yrs). Nocturnal enuresis is a significant developmental challenge for school age children and it can cause emotional and family stress and social isolation for the child. Mono symptomatic nocturnal enuresis is bedwetting occurring without any

day time incontinence or urological symptoms and it might be an explanation of a normal void occurring at an inappropriate and socially unacceptable time and place. Nocturnal enuresis resulted from the interaction of three physiological factors such as arousal disorder (defective sleep arousal); high nocturnal urine production (nocturnal polyuria); and nocturnal low bladder capacity or elevated detrusor activity, such as lack of prevention of bladder emptying during sleep, lowered bladder capacity, or bladder over activity.

**Keywords:** Arousal disorder; Elevated detrusor activity; Nocturnal enuresis; Nocturnal low bladder capacity; Nocturnal polyuria; Risk factors

## INTRODUCTION

Nocturnal enuresis is expressed as any intermittent incontinence during a sleep in a child being at least five years old [1]. Nocturnal enuresis is a significant developmental challenge for school age children and it can cause emotional and family stress and social isolation for the child [2]. Chronic anxiety, impaired self-esteem, and delayed developmental steps such as attending camps or sleeping at a friend's house may occur as secondary challenges. The psychological and developmental injury may actually be more significant and devastating to the child than the symptom of enuresis itself [3]. Nocturnal enuresis can be classified into two groups such as mono-symptomatic nocturnal enuresis; which is bedwetting occurring without any day-time incontinence or urological symptoms and it might be an explanation of a normal void occurring at an inappropriate and socially unacceptable time and place [4]. Bedwetting correlated with day time indicators of bladder dysfunction, such as urgency or toileting frequency, is thought out poly symptomatic or non mono symptomatic nocturnal enuresis. Pediatric with non mono symptomatic nocturnal enuresis present with urge, frequency, or incontinence due to enuresis. Patients with nighttime wetting plus urge, incontinence, and frequency are considered to have poly symptomatic nocturnal enuresis [5,6]. Nocturnal enuresis is defined as the involuntary loss of urine at night, in the absence of organic (physical) disease such as urinary tract infection or detrusor over activity, at an age when a child could reasonably be expected to be dry (by consensus, at a developmental age of five years) [7]. Nocturnal enuresis is more commonly observed in pediatric and it may negatively affect the child's psychosocial development as well as interfere with the development of self-confidence and the ability to socialize [8]. Nocturnal enuresis can be separated into two types; which called as primary nocturnal enuresis: Primary nocturnal enuresis is the most common form of pediatric nighttime urinary control without a period of six consecutive months. Primary nocturnal enuresis is therefore bedwetting in a child aged five yrs or more who has never been dry for extended periods [9]. Secondary nocturnal enuresis: Pediatric with a period of six consecutive months of nighttime urinary control before incontinence. Secondary nocturnal enuresis is the onset of wetting after a continuous dry period of more than six to twelve months which can be caused by such as urinary tract infection, diabetes mellitus, spina bifida and epilepsy [10]. Family history of nocturnal enuresis, changes in antidiuretic hormone secretion rhythm, sleep disorders, retarded bladder maturity,

immature nerve development, psychology, and environment are the contributing elements for nocturnal enuresis [11].

## LITERATURE REVIEW

### Risk factors of nocturnal enuresis

Nocturnal enuresis resulted from the interaction of three physiological factors such as arousal disorder (defective sleep arousal); high nocturnal urine production (nocturnal polyuria); and nocturnal low bladder capacity or increased detrusor activity, such as lack of prevention of bladder emptying during sleep, lowered bladder capacity, or bladder over activity [12].

Physiological factors involved in nocturnal enuresis are discussed in turn below

**Arousal disorder (defective sleep arousal):** Enuresis may be more correctly analyzed as a challenge with awakening from sleep. In most pediatric with enuresis the arousal response is impaired during sleep. When urine volume exceeds bladder capacity, bedwetting occurs; although arousability is reduced, the sleep architecture itself is usually unaltered, and enuresis occurs in all sleep stages, especially during non-rapid eye movement sleep [13]. In normal pediatric, when the bladder reaches maximum capacity, there is a sudden urge for urination that does not occur correctly in enuretic pediatric. Chronic over stimulation leads to down regulation of the voiding center [14]. The risk factors for nocturnal enuresis involve long term use of disposable diaper, being male, and difficulty in awakening at night, mental stress, poverty, and family environment. With the use of disposable diaper, toilet training may be delayed [15].

**High nocturnal urine production (nocturnal polyuria):** Many pediatric with nocturnal enuresis have an altered diurnal rhythm of vasopressin secretion, resulting in the generation of excessive amounts of relatively dilute urine overnight. The expected bladder capacity is calculated by the formula: (age in years+1) × 30 ml, which is valid from two to twelve years. Nocturnal polyuria can be defined as greater than 130% of the expected bladder capacity for age [16]. 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 pediatric with trouble awakening, incontinence. Under normal situations, nocturnal vasopressin secretion is higher than in the daytime and leads to 50% less urine generation during the night [17]. Additionally, insufficient secretion of the

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antidiuretic hormone, which also leads to the production of more urine, has been seen in pediatric and the frequency of this is thought to be around two out of three pediatric [18].

### DISCUSSION

**Nocturnal low bladder capacity or increased detrusor activity:** In pediatric with nocturnal enuresis, the emptying reflexes of the full bladder are not sufficiently prevented during sleep, resulting in involuntary voiding. The pontine micturition center of the brain stem is involved in bladder factors process [19]. Individuals with primary nocturnal enuresis have a functional bladder capacity corresponding to 70% of the expected capacity. An increase in bladder wall thickness was also resulted with ultrasonography of the identical in individuals. Pediatric with primary nocturnal enuresis, electroencephalography and cystometry records observed that bladder contractions could not be prevented in 30%-32% of enuretic pediatric [20,21].

### CONCLUSION

Nocturnal enuresis is defined as the involuntary loss of urine at night, in the absence of organic (physical) disease such as urinary tract infection or detrusor over activity, at an age when a child could reasonably be expected to be dry (by consensus, at a developmental age of five years). Mono symptomatic nocturnal enuresis means bedwetting without any other lower urinary tract symptom. Nocturnal enuresis results from the interaction of three physiological factors such as arousal disorder (defective sleep arousal); high nocturnal urine production (nocturnal polyuria); and nocturnal low bladder capacity or elevated detrusor activity, such as lack of prevention of bladder emptying during sleep, lowered bladder capacity, or bladder over activity.

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### COMPETING INTERESTS

The author has no financial or proprietary interest in any of material discussed in this article.

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