

Secondary Enuresis: Post-traumatic Stress Disorder in Children after Car Accidents

Tal Eidlitz-Markus MD, Avinoam Shuper MD and Jacob Amir MD

Department of Pediatric Day Care, Schneider Children's Medical Center of Israel, Petah Tiqva, and Sackler Faculty of Medicine, Tel Aviv University, Israel

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Abstract

Background: In our experience, secondary enuresis nocturna is a common complaint among children after a motor vehicle accident. However, as these children are often brought for examination as part of an insurance compensation claim, this complaint is not always reliable.

Objective: To describe a series of children in whom secondary enuresis occurred after a motor vehicle accident.

Methods and Results: Five children were brought to our clinic for evaluation of secondary nocturnal enuresis. Review of past history revealed a car accident preceding the onset of the enuresis. All but one had additional behavioral symptoms typical of post-traumatic stress disorder. Four children had evidence of head trauma, and one had psychological but no physical trauma.

Conclusions: Nocturnal enuresis can occur after a motor vehicle accident due either to purely psychological trauma or organic head trauma. While nocturnal enuresis is generally attributed to organic causes, psychological mechanisms also play a significant role.

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Nocturnal enuresis is defined as the repeated involuntary passage of urine during sleep in children above 5 years of age. The psychological cause is unknown, but the disorder appears to involve delayed maturation of the cortical or central autonomic mechanisms that regulate voluntary control of the micturition reflex [1,2]. Most cases of enuresis are primary, i.e., occurring in a child who has never had night-time continence [2]. Secondary enuresis usually appears between the ages of 5 and 7 years; it is uncommon after age 7. Patients with secondary nocturnal enuresis should be examined for neurological or spinal abnormalities; and diabetes mellitus, diabetes insipidus, renal failure and urinary tract infection need to be ruled out. If there are no daytime symptoms or findings on physical examination, and urinalysis and culture are normal, further evaluation for urinary tract pathology is not necessary.

The relationship of psychological factors to enuresis remains unclear. The condition has been associated with

psychiatric disorders, and affected children are frequently referred for psychological treatment [3]. Prospective studies with baseline information on behavior have suggested that children with secondary enuresis had more psychiatric symptoms before the onset of the disorder than children of the same age who were never bed-wetters [4]. Though some authors claim that there is a direct link between onset of secondary enuresis and stressful events, such as the birth of a younger sibling [3] or severe head injury [5], others completely dismiss this possibility [2].

Post-traumatic stress disorder is a delayed protracted response to a stressful event or situation of an exceptionally threatening or catastrophic nature. In children, symptoms include hyper-reactivity, decreased attention span, temper outbursts, sleep disturbances, moodiness, discipline problems, and social withdrawal. Dizziness and headaches may also be present [5]. Enuresis has only rarely been mentioned in PTSD [6].

In our experience, secondary enuresis nocturna is a common complaint among children following a motor vehicle accident. However, as these children are often brought for examination as part of an insurance compensation claim, this complaint is not always reliable.

In the present study we report on five children seen in the Pediatric Day Care Unit of Schneider Children's Medical Center of Israel for the evaluation of newly appearing nocturnal enuresis. Past history revealed that all had been victims of a car accident before the start of the enuresis and four had signs and symptoms of PTSD [7].

Case Descriptions

The pertinent medical data of the five patients are presented in Table 1.

Case 1

An 8-year-old boy presented with headache and nocturnal enuresis that had begun 6 months earlier after his involvement in a car accident. The accident caused head trauma without concussion, facial lacerations that required stitches, and left shoulder and thigh contusions. The patient was examined in the emergency room and discharged the same day. Since the accident, his school

PTSD = post-traumatic stress disorder

Table 1. Demographic, clinical and behavioral data of children with secondary enuresis following involvement in a car accident

| Patient | Age (yr) at presentation | Sex | Accidental injury | Concomitant physical symptoms |
|---------|--------------------------|--------|---|-------------------------------|
| 1 | 8.5 | Male | Head trauma, facial lacerations, contusions of thigh and shoulder | None |
| 2 | 5.0 | Male | None | None |
| 3 | 5.0 | Male | Head trauma, contusion of shoulder | Headache, abdominal pain |
| 4 | 5.0 | Male | Facial laceration, tibial fracture | Headache |
| 5 | 8.5 | Female | Neck and head trauma, contusions of elbow and leg | Headache |

grades had dropped and he had been having nightmares and nocturnal enuretic episodes two to three times a week. He also expressed fear of teachers and friends. His parents reported that he had been fully toilet-trained by age 18 months. Complete physical and neurological examinations were normal. Renal tests and urinalysis revealed no abnormalities, nor did electroencephalography and computed tomography of the head. At 6 months after the accident the patient began psychological therapy. At 9 months follow-up, no clinical improvement in symptoms was noted, and the nightmares and nocturnal enuresis continue.

Case 2

A 5-year-old boy was the victim of a car accident at age 4 years. He had been sitting in a children's car seat in the back of his parents' car and was witness to his father's severe injury; the patient himself suffered no physical trauma. He was examined in the emergency room and discharged without medical treatment. Since the accident, he had almost daily episodes of nocturnal and diurnal enuresis, although he had been fully toilet trained by age 3. There were no other behavioral symptoms. Physical and neurological examinations were normal, as were renal tests, ultrasonography, urinalysis and cultures.

At the 5 month follow-up, the diurnal enuresis had stopped, but there was no change in the frequency of the nocturnal episodes. The patient was referred for psychological evaluation.

Case 3

A 5-year-old boy presented with complaints of severe nocturnal headache, sleep disturbances, abdominal pain and episodes of enuresis every night. He had been completely dry at night since age 2. These symptoms had begun at age 4, 2 weeks after his involvement in a car accident. During the accident he lost control of the bowel and bladder but did not lose consciousness. He suffered head trauma without concussion and contusion of the right shoulder. CT of the head, urinalysis, cultures and abdomi-

nal sonography revealed no pathological findings. At follow-up after 8 months, no clinical improvement was observed. The enuresis persists with the same frequency.

Case 4

A 5-year-old boy presented with complaints of headache, behavioral problems and nocturnal enuresis. The symptoms had begun one year earlier, 3 days after his involvement in a car accident in which he suffered lacerations of the face and head and fracture of the left distal tibia. The fracture was treated by plaster cast, and the patient was observed overnight in the emergency room. After the accident, he began to fear and avoid his friends and to complain of headaches. He had enuretic episodes every night, though he had been fully toilet trained by age 3 years. Physical and neurological examinations were normal. CT of the head revealed no pathological findings except for maxillary sinusitis. Urinalysis was normal. The patient was referred for psychological evaluation. His physical and psychological symptoms have not improved during a follow-up of 2 years despite psychotherapy.

Case 5

An 8-year-old girl presented with headache and nocturnal enuresis that had begun 6 months earlier after her involvement in a car accident. She had sustained neck trauma and minor head trauma without concussion, and multiple left elbow and thigh contusions. She was examined in the emergency room and discharged the same day. Since the accident she has suffered daily sleep disturbances and nocturnal enuretic episodes despite the fact that she had been fully toilet trained by age 3 years. She also complained of headaches almost every day.

On examination, physical and neurological states were normal. Urinalysis was also normal. At 5 month follow-up, no change in clinical symptoms was noted. The examining physician recommended psychological treatment, but the parents refused.

Discussion

Five children with nocturnal enuresis secondary to involvement in a car accident are presented. In all cases the enuresis was resistant to psychotherapy.

PTSD is a delayed, prolonged reaction to direct or indirect exposure to extreme traumatic stress, involving disorganized or agitated behavior [7]. Characteristic symptoms in adults are a persistent re-experiencing of the traumatic event, avoidance of stimuli associated with the event, a numbing of general responsiveness, and continuous increased arousal. According to the DSM-IV criteria [7], the symptomatic picture must be present for more than one month, and the disturbance must cause clinically significant impairment in social, occupational or other important areas of functioning.

In young children, distressing dreams of the event may, within several weeks, change to generalized nightmares of monsters or of rescuing others. Children may also exhibit

physical symptoms, such as stomachache and headache. Since children often do not understand that they are reliving the past and may find it difficult to report diminished interest in significant activities and constriction of affect, the physical symptoms should be carefully evaluated together with reports from parents, teachers and other observers [7].

One of the few references in the literature to enuresis as part of PTSD was in Lacey's report of the 1966 Aberfan disaster [8], when 107 primary school children were killed by a landslide. During the first 4 years after the event, 56 of the 143 survivors were referred by their parents for related physical and psychological problems; 19 of them had lost a sibling, and the remainder a close friend or relative. The most common symptoms were sleep disorders, lack of friends, unwillingness to go to school or out to play, and instability. Some had enuresis, but the frequency and duration were not detailed.

Head injuries in children can also cause psychological sequelae. Some children have persistent emotional and behavioral disorders, whereas others show a pattern of recovery. Some of the behavioral features are relatively distinct and specific to severe head injury, such as outspokenness and impulsiveness. Overeating, enuresis, and slowness are apparently important sequelae of very severe head injuries [5].

In all five of our patients, the occurrence of the secondary diurnal or nocturnal enuresis immediately followed the traumatic event. Three of the children were 4–5 years of age, in agreement with earlier findings that this age group is prone to secondary nocturnal enuresis after early stressful events [3]. All five sustained minor injuries, and none was hospitalized. Four sustained head trauma (cases 1,3,4 and 5), and all four also had behavioral symptoms typical of PTSD, namely sleep disturbances, social withdrawal and fear of school that continued for many months without spontaneous recovery. This finding is compatible with many studies reporting a long course (>12 months) for PTSD [9]. However, children do improve with time. Follow-up studies of Israeli schoolchildren involved in car accidents have demonstrated that the initial high level of stress reaction decreased markedly over nine months [5,6]. Six years after the Aberfan disaster, Lacey [7] reported that the treated children had recovered from the

trauma. We therefore anticipate that the urinary disorder of the children described here will gradually lessen and disappear together with their other physical and behavioral symptoms.

While in four of our children the head trauma sustained in the accident may have led to activation of central mechanisms that are presumably involved in nocturnal enuresis [2], patient 2 is exceptional because he did not experience any physical injury, though he witnessed his father being injured. This case indicates that psychological trauma, in this case during a car accident, can by itself cause enuresis.

We conclude that secondary nocturnal enuresis may present as a significant component of PTSD in children who are victims of car accidents. While in some cases head trauma may be a causative factor, in others the psychological impact of the accident alone may induce enuresis. The underlying mechanism of enuresis in such cases remains unclear.

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Correspondence: Dr. T. Eidlitz-Markus, Dept. of Pediatric Day Care, Schneider Children's Medical Center of Israel, Beilinson Campus, Petah Tiqva 49202, Israel. Tel: (972-3) 925 3663; Fax: (972-3) 925 3042.