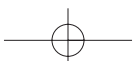
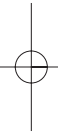


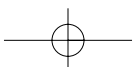
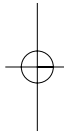
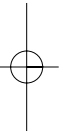
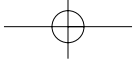


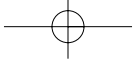
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## **PART I**

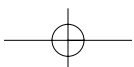
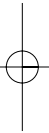
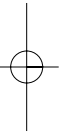
# Neurally mediated (reflex) syncope

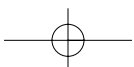
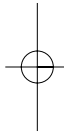
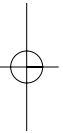
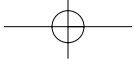






# Clinical presentation





## 1

## CASE 1

# Vasovagal fainting in children and teenagers

W. Wieling

## Case report

A 14-year-old boy was referred to our syncope unit for analysis of an unexplained episode of transient loss of consciousness. The episode occurred while the boy had been standing still after running during a soccer competition game. The patient denied experiencing any prodromal symptoms. The duration of the loss of consciousness was short (< 1 min).

**Table 1.1** Classification of reflex syncope based on triggers.

### Reflex-mediated

#### *Vasovagal syncope*

- Emotionally induced—e.g., venipunctures, immunizations, sight of blood) (central type)
- Orthostatically induced (peripheral type)

#### *Ocular syncope*

#### *Gastrointestinal*

- Swallow syncope
- Esophageal stimulation
- Gastrointestinal tract instrumentation
- Rectal/vaginal examination
- Defecation syncope

#### *Urogenital*

- (Post-)micturition syncope
- Urogenital tract instrumentation
- Pulmonary airway instrumentation

### Mechanical/hydraulic factors

#### *Initial orthostatic hypotension*

#### *Increased intrathoracic pressure: cough and sneeze syncope*

- Wind instrument player's syncope
- Weight lifter's syncope
- Mess trick and fainting lark
- Stretch syncope

The patient's general health was excellent. Evaluations by two pediatricians, a pediatric cardiologist and a pediatric neurologist, including several electrocardiograms, an echocardiogram, a 24-h Holter recording, an exercise test, and blood examinations, were unremarkable. The patient was advised to refrain from playing soccer.

Additional history-taking revealed that three additional episodes of transient loss of consciousness had occurred—one while he had been standing still on a warm day during a vacation with his parents in Paris while a street artist was making a drawing of him. The other episodes also occurred when he was standing motionless while a friend of his mother was giving him a haircut. During these episodes, he was reported to be pale and sweating. Nausea was present during one of the episodes.

On the basis of this history, reflex vasovagal syncope was diagnosed. The mechanisms underlying the episodes were explained to the patient and his parents. The young patient and his parents were reassured and informed about lifestyle measures. The boy started to play soccer again, and no further syncopal episodes occurred.

## Comment

By far the most common cause of transient loss of consciousness in young patients is a reflex syncopal event, particularly vasovagal fainting [1,2]. A variety of triggers have been identified (Table 1.1).

Two clinical scenarios in particular are known to provoke vasovagal fainting in young patients. First and foremost are situations that increase the pooling of venous blood below the heart, such as long periods

## 6 PART I Neurally mediated (reflex) syncope

**Table 1.2** Typical premonitory symptoms for reflex syncope.

- 
- Lightheadedness, dizziness
  - Palpitations
  - Weakness
  - Dimming or blurred vision
  - Fading hearing, tinnitus
  - Nausea, epigastric distress
  - Feeling warm or cold
  - Facial pallor
  - Sweating, dilated pupils
- 

of standing motionless, particularly in combination with elevated ambient temperatures. Young patients often experience prodromal signs and symptoms when a spontaneous vasovagal syncope is imminent (Table 1.2) [1,2]. These prodromes are reported to be more intense than those in elderly patients, perhaps related to more robust autonomic control. However, some young patients have little or no prodromal symptoms or do not recognize them, as during the first episode in this patient. The collapse occurs without warning. The second scenario is syncope at the time of distressing emotional situations or pain, which also appears to be more common in the young. A typical example is an event when a blood sample is being taken. Other emotional triggers reported in young patients include having the hair cut or brushed (as in this case), eye examinations or manipulation, dental procedures, or watching television programs about medical matters or animal biology [1–4].

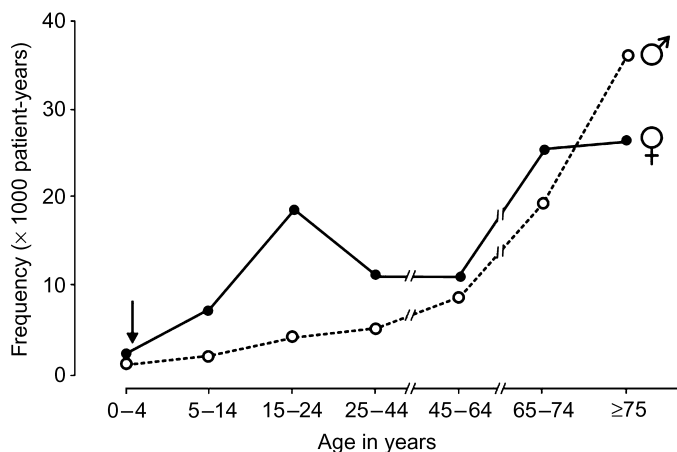
The clinical presentation of vasovagal syncope may vary widely both within and among young patients [1,2]. The trigger may be emotional for one event and

postural for another. Vasovagal episodes may also occur without an identifiable trigger, even in patients who are sitting. Apparently benign vasovagal episodes may also occur during normal daily exercises such as playing, walking, or cycling and even during strenuous exercise. However, when syncope occurs during exercise, a cardiac cause such as a long QT syndrome or catecholaminergic ventricular tachycardia should always be excluded [1,2].

It is important to consider all episodes and not just one unexplained event. When there is a history of typical vasovagal syncope for some of the episodes, the atypical presentations are very likely to be of vasovagal origin as well [1,2]. Events that occur when the patient is supine, in the absence of an emotional stimulus, are unlikely to be vasovagal, but vasovagal syncope during sleep has been described [5]. Additional reflex syncope events that are typical of young patients include initial orthostatic hypotension (see Case 42), adolescent stretch syncope [6], postural tachycardia syndrome, and the fainting lark (see Case 45). “Stretch” syncope may occur during stretching with the neck hyperextended while standing. It is reported to occur in teenage boys with a familial tendency to faint. It has been attributed to the effects of straining (which decreases systemic blood pressure) in combination with decreased cerebral blood flow caused by mechanical compression of the vertebral arteries [6].

The incidence of syncope coming to medical attention appears to be clearly increased in two age groups—the young and the old (Fig. 1.1) [1,7].

A peak in the incidence occurs around the age of 15 years, with girls having more than twice the incidence among boys [8].



**Figure 1.1** Frequency of the symptom of fainting as the reason for presentation in general practices in the Netherlands. The data are drawn from the General Practitioners' Transition Project, which includes an analysis of 93 297 patient-years. The arrow around 1 year is to indicate that a small peak occurs between 6 and 18 months (breath-holding spells). (Reproduced with permission from [11].)

Syncope is an infrequent occurrence in adults. The incidence of syncope progressively increases over the age of about 40 years to become high in the older age groups. A lower peak occurs in older infants and toddlers, most commonly referred to as “breath-holding spells” [2].

The incidence of syncope in young patients coming to medical attention varies from approximately 0.5 to three cases per 1000 (0.05–0.3%) [9]. Syncopal events that do not reach medical attention occur much more frequently. In fact, the recently published results of a survey of students with an average age of 20 demonstrated that about 20% of the men and 50% of the women reported having experienced at least one syncopal episode [8]. By comparison, the prevalence of epileptic seizures in a similar age group is approximately five per 1000 (0.5%) [10], and cardiac syncope (i.e., cardiac arrhythmias or structural heart disease) is much less common [1,7].

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