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Non-pharmacological methods of treatment and prevention of vasovagal syncope

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Abstract

Fainting is a transient loss of consciousness resulting from a momentary ischemia of the central nervous system. One type of syncope is vasovagal syncope, otherwise known as reflex or neurogenic syncope. The consequence of fainting may be a fallen injury. It is therefore important that the doctor intervene quickly after such an episode to determine the cause of the fainting. An interview, which is one of the most important parts of diagnosis, provides a lot of valuable information. Once the correct diagnosis has been made, it is important to start the treatment procedure. In the case of vasovagal syncope, the first step is to educate the patient and his family about how to deal with the condition, which causes such a reaction of the body. The patient must

know the manoeuvres that will interrupt the fainting. Next, the patient is recommended to be physically active, e.g. moderate exercise, tilt training. If the non-pharmacological methods do not produce results, pharmacology is introduced, and if it also fails, the use of stimulators is recommended. Non-pharmacological methods, which are the first to be used in a given case, as well as non-pharmacological methods are the subject of research of many scientists. This article describes methods of non-pharmacological management of vasovagal syncope, which can be used by anyone suffering from this condition as non-invasive.

Key words: vasovagal syncope, vertical training, non-pharmacological treatment of vasovagal syncope

Introduction

Vasovagal syncope (reflex, neurogenic) is the result of a disturbed reflex reaction that leads to vasodilation or bradycardia [1].In most cases, reflex syncope affects young people. About 25-30% of people encounter the problem at least once in their lives [2].

Among vasovagal syncope we can distinguish the peripheral and central type. The first type most often occurs as a result of being standing for too long. The second type is most often caused by severe stress and pain. Both peripheral and central types are short-lived and may be associated with drug intake, dehydration or high temperature [3]. VASIS classification is commonly used in clinical diagnostics [4, 5].This classification distinguishes three types of reflex syncope :

1. Cardiodepressive
2. Vasodepressive
3. Mixed

When a person faint, there is a high risk of injury from falling. Recurrent fainting worsens the quality of life of a person suffering from fainting [6]. Therefore, the diagnosis of the patient and the introduction of appropriate treatment is an important element. This article presents the basic diagnostics of vasovagal syncope, as well as therapeutic management. Nonpharmacological treatment is discussed in more detail.

Diagnostic procedures

The basic procedure in the case of vasovagal syncope in order to make a proper diagnosis is to conduct a thorough interview. The 24-hour Holter ECG registration, tilt tests and

neurological examination are also used [7].

The Tilt Test provokes fainting in patients with suspected vasovagal syncope [8].The sensitivity of the test can be increased by using additional pharmacological provocation. The drugs used for this purpose are:

- Nitroglycerin
- Isoprenaline
- Esmololol
- Edrophonium
- Adenosine

Research conducted by Kozłowski et al. shows that during the passive tilt test, fainting observed in 24% (38 subjects) of the subjects additionally observed that 19% of the patients lost consciousness after 45 minutes of the test, which indicates that the test was performed more correctly 60 minutes instead of 45 minutes. In subjects with negative results, nitroglycerin was used sublinguistically to increase the sensitivity of the test. A positive result was recorded in 34%, i.e. 54 persons, a false positive response in 5% and a negative response in 36%. The tilt test lasting one hour has a higher sensitivity. The Tilt test with drugs may be performed only if there are no contraindications [4].

Nonpharmacological treatment

Treatment of vasovagal syncope is aimed at preventing repeat incidents and injuries resulting from syncope and improving the quality of life of people with this problem.

Regardless of the form of neurogenic fainting, the first stage of treatment is education of the patient. It is recommended to avoid conditions that may favour fainting such as high temperatures, overcrowded rooms, coughing, and pay special attention to hydration of the body. Persons with reflex fainting must familiarize themselves with the symptoms preceding the loss of consciousness and learn manoeuvres to help prevent such an event.

The patient should introduce a number of changes in everyday life. During sleep, the head should be higher than the rest of the body, thanks to which the reflexes protecting against fainting are constantly activated. Changes in lifestyle also include a diet. If there are no contraindications, it is important to take more salt and electrolytes [1, 6]. This leads to an increase in the volume of the vascular bed, prevents hypovolemia, and maintains blood flow in the brain [1, 2].

The patient is recommended to have moderate physical activity (e.g. swimming) [1].

Other physical activities in the case of syncope include: hand clamp test, leg crossing with lower limb muscle tension, tilt training [9]. When selecting exercises for the patient, the patient's capabilities should be assessed individually, taking into account his age and health condition, as well as his general condition [3]. In 2014, studies were conducted on the effectiveness of physical training in the treatment of cardiogenic syncope. The study lasted 12 weeks, during which time patients underwent aerobic training. It was noticed that after this time the number of positive head tilt tests decreased and the time of orthostayic tolerance in standing position increased. However, the observation period was short, which made it impossible to assess the recurrence of syncope [10].

Among the non-pharmacological methods of preventing fainting at the time of symptoms, it is recommended to use isometric and stretching of lower limbs, crossing legs, stretching the forearm, squeezing an object (e.g. a ball) in the hand. Isometric exercises increase adrenergic activity and peripheral resistance. The brain flow also increases [1]. The usefulness of isometric contraction was demonstrated by Bringole et al. in his studies. The isometric contraction of the arm was applied at the time of vasovagal syncope symptoms. The effectiveness of the method was estimated at 99% [11].

Studies conducted by Crocci et al. on the effectiveness of arm isometric exercises to break impending vasovagal syncope also showed a positive effect of this manoeuvre. The study involved 29 people suffering from vasovagal syncope. Participants were trained in how to tighten their arms when symptoms of reflex fainting appeared. Within 14 +/- 6 months, 19 people reported a total of 260 pre-completion situations. These persons performed isometric arm tension in 98% of cases and were able to prevent fainting in 99.6%. This way of preventing vasovagal syncope is well accepted by patients and fully safe for them [12].

A study conducted by Kye Hun Kim et al. compared the use of squatting, leg crossings and muscle tensioning and hand compression as methods to prevent vasovagal syncope. The study involved 50 subjects who underwent a head tilt test. Then the participants were divided into 3 groups: group I with 27 positive test patients, group II with 23 negative test results, group II with 21 healthy people. It was found that leg crossing significantly increased systolic blood pressure in the studied groups. Squatting maneuver caused an increase in systolic and diastolic blood pressure also in three groups. There was no change of heart rate in any of the groups or significant influence of manoeuvre on haemodynamics. During the study, 13 out of 21 subjects

had prodromal symptoms, 5 passed out without the possibility of manoeuvring immediately after the symptoms occurred, another 7 subjects interrupted the fainting by crossed legs and squatting, and only 1 by clenching their fists. The study shows that crouching and cross-breeding of legs are the methods that can be used by both of them to prevent vasovagal syncope. [13]

Other maneuvers used during the symptoms of vasovagal syncope include lying down, compressing the abdomen or wearing a belly belt. Wearing compression stockings, which reduce the amount of blood in the lower limbs, may also be helpful [14].

Vasovagal syncope non-pharmacological treatment also includes vertical training [14, 15, 1,] It enables the patient to adapt to the factors causing vasovagal syncope. The patient is recommended to lean against the wall and hold the vertical position as long as possible, the exercise time is gradually extended. If the patient is able to perform this task for 3 days in a row for 45 minutes, the training is deemed to have ended successfully. This type of task requires the commitment of the patient [1, 15]. Joanna Jędrzejczyk-Spaho et al. conducted research on the effectiveness of this method. The effectiveness of vertical training and education of patients to prevent fainting was evaluated. It was shown that compliance with medical recommendations in the field of prophylaxis reduces the frequency of recurrences of syncope. Vertical training and prophylaxis improve the quality of life and reduce the level of anxiety regarding recurrence of syncope [16]. The positive influence of tilt training was studied by Gajek et al. In the majority of patients this method proved to be effective. It was noted that in the early stage of training, syncopal or presyncopal episodes and positive results of sway tests are more frequent than in the later stage of training. Stopping training causes a recurrence of positive results of slope tests despite the absence of spontaneous syncope episodes [17].

A randomized study was also conducted to evaluate the effectiveness of sway training in the treatment of vasovagal syncope. Patients with recurrent vasovagal syncope were included in the study, who passed the head tilt test twice. The subjects had 3 days, 30 minutes a day, 6 days a week to train against the wall. Patients performed the test at home. Patients were instructed on how to safely perform the test. Each participant received a form in which they recorded their training sessions, duration and symptoms. Finally, the heel prick test was repeated to assess the effectiveness of the training. 19 out of 32 patients, i.e. 59%, had a positive test result, only 13 patients (41%) had a negative result. The authors of the study show that training did not reduce recurrent fainting significantly. According to the authors of the study, this training is only for

very involved groups of people [18]. Another study was conducted in a group of 32 patients with recurrent neurocardiogenic syncope. The training program lasted 2 months. After this time, the authors of the study observed a positive effect of the training. 81% of the respondents did not report recurrent syncope [19].

Pharmacological treatment

When non-pharmacological treatment methods do not bring the expected improvement, pharmacological methods shall be implemented in selected cases. They shall apply:

- miodryna, in a dose of 5-40 mg/d to shrink the vessels
- metropolis or atenolol, however, in case of persons with dysautonomic syndromes or concomitant asytolia, it may intensify bradycardia.
- Serotonin reuptake inhibitor - paroxetine 20 mg/d

Pharmacological treatment in most cases also does not provide the expected results [1].

Invasive treatment

Invasive treatment for reflex syncope is based on the implantation of a dual-chamber pacemaker with a special rate drop response algorithm. It allows to start a quick stimulation at the moment of bradycardia build-up. Such a solution is applied only in selected cases in patients over 40 years of age with long-term asytolysis [1].

Conclusion

Despite numerous studies, there is still no single good treatment for vasovagal syncope. Scientific studies related to physical training and vertical training do not give clear results as to the effectiveness of these methods. The main task in the case of vasovagal syncope treatment is to prevent relapse. Education of the patient in this field is of great importance in prevention. Patients can learn appropriate manoeuvres such as isometric contractions of large muscle groups or squatting, which can be used when symptoms of fainting appear. Research shows that these methods are very helpful in many cases and prevent fainting. On the subject of reflex syncope, research should still be carried out to determine how to treat it effectively.

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