Life-saving maneuvers during a tilt test

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The vasovagal syncope is a frequent clinical problem, representing 21 % of all types of syncope; this percentage is probably underestimated since 36.6 % of vasovagal syncope is of unknown origin [1]. The cardio-inhibitory syncope is classified as type 2 vasovagal syncope (VASIS classification), and can be triggered by the tilt test. It is defined as asystolic (type 2B; 4–33 %) when asystole occurs for more than 3 s. Occasionally, asystole can last more than 5 s (9.1 %); however, only very few cases are reported in the literature of asystole duration >30 s [2] and notably, none of those reported required life-saving maneuvers.

In the present report, we describe the cases of a 32-year-old woman and a 31-year-old man with a history of several syncope episodes of uncertain origin, for which there was an indication to obtain a tilt test. The syncopal episodes in both cases looked similar to vasovagal episodes, as they occurred in the standing position with few presyncopal symptoms. No one noted an absence of heart beat. In addition, no elements of fear were reported or predictive signs of an asystolic event.

The tilt test was performed according to the so-called “Italian protocol,” i.e., both patients, free from drugs, were administered sublingual nitroglycerin after 20 min of passive orthostatic standing at 60°. A few minutes later, the

patients had an asystolic syncopal episode (Fig. 1), which lasted approximately 40 and 42 s (during which we recorded a few ventricular escape beats). Placing the patients in the Trendelenburg position did not restore the sinus rhythm, therefore, external cardiac massage was provided. The sinus rhythm resumed after a few seconds, likely because of the cardiac massage. Although syncopal recurrences are common, and may clearly decrease the quality of life, tilt-induced asystole does not necessarily imply increased risk of death, or the need to undergo major therapeutic procedures. In addition, syncope recurrence in patients with tilt-induced asystole is comparable to that in patients who did not have an asystolic response during tilt testing [2]. The treatment for patients with vasovagal syncope with asystole is the same as for patients with other forms of vasovagal syncope, including all preventive measures related to life style. It has been reported that pharmacological therapy does not significantly influence the clinical outcome [2]. Pacemaker implantation could be relatively beneficial only in the vasovagal asystolic syncope although its real-life effectiveness has not been demonstrated [3]. Thus, it should be considered as the last option in a selected number of patients with recurrent syncopal episodes, who do not respond to behavioral therapies, and who have their quality of life compromised [3].

Here, we report that in a cohort of 100 individuals subjected to the tilt test, we observed two very long-lasting, non-spontaneously resolving asystole during vasovagal syncope, both lasted more than 30 s, and both required cardiopulmonary resuscitation. Such prolonged events, although reported in the literature, are very unusual. In addition, in all reported cases, the restoration of sinus rhythm occurred spontaneously, just placing the patient in Trendelenburg position without the need for life-saving

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Fig. 1 Asystole. The first sinus heart beat appears after approximately 40 s (*upper image*). Artifacts from cardiac massage are visible (*white arrows*). The first sinus heart beat appears after approximately 42 s (*lower image*). Artifacts from cardiac massage are visible

(*white arrow*). In both cases, few ventricular escape beats are visible (*black arrows*), the sinus rhythm resumed after cardiac massage

maneuvers. Although the restoration of the sinus rhythm could have been coincidental, we note that in both cases the sinus rhythm resumed after the external cardiac massage was initiated. Since it is uncertain whether or not the restoration of sinus rhythm would have occurred without

the cardiopulmonary resuscitation, we strongly recommend this procedure in case of prolonged asystole.

Our observation indicates that although the tilt test is considered a diagnostic study associated with a very low risk of serious adverse effects, extreme caution, including

the presence during the procedure of medical staff specialized in life-saving maneuvers, is required during the execution of this test since the occurrence of prolonged asystole may be unpredictable and potentially life threatening.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Statement of human and animal rights This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent For this type of study formal consent is not required.

References

1. Soteriades ES, Evans JC, Larson MG, Chen MH, Chen L, Benjamin EJ et al (2002) Incidence and prognosis of syncope. *N Engl J Med* 347:878–885
2. Baron-Esquivias G, Pedrote A, Cayuela A, Vale JI, Fernandez JM, Arana E et al (2002) Long-term outcome of patients with asystole induced by head-up tilt test. *Eur Heart J* 23:483–489
3. Sud S, Massel D, Klein GJ, Leong-Sit P, Yee R, Skanes AC et al (2007) The expectation effect and cardiac pacing for refractory vasovagal syncope. *Am J Med* 120:54