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Case report

Patient with syncope

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Abstract Male patient, 60 years old, is referred for the first time to Pacemaker Center Zajecar on 26th of July 2018. for assessment of possible indication for pacemaker implantation. After initial evaluation (History, Clinical exam and ECG) with normal findings patient hade Additional evaluation for syncope. He has done a three 24-hour Holter recordings with no significant disturbances in excitability or conductivity. Sinus bradycardia was found during sleep. During the day hours, a chronotropic competence is maintained. Exercise test that he has also done is described as negative for ischemic disease, with preserved chronotropic competence. Echocardiography described like normal finding.Neurological exams: clinical finding is normal. MRI of the head was done, also with normal findings. The patient was implanted with implantable loop recorder in left pectoral region, the device was Medtronic Reveal LinQ. During regular device electronic check up we found a several pauses detection of which the longest was 45s in duration. Based on these recordings, an indication for pacemaker implantation was made.Conclusions: Cardiac syncope represents a clinical and diagnostic challenge. An implantable loop recorder is an adequate diagnostic tool for cardiac syncope detection in patients with syncope of unknown origin. Pacemaker implantation is a permanent solution for treatment of cardiac syncope caused by bradyarrhythmia events.

Key words Syncope, Loop recorder, Pacemaker.

Introduction

A syncope is a syndrome which is defined as a sudden, transient loss of consciousness with inability to maintain postural tone, provoked by impaired brain perfusion. The event is short with complete and spontaneous recovery.

Pre-syncope is comprised of symptoms which precede the syncope. Usually they are vertigo or visual sensation like “tunnel vision” or different levels of consciousness alterations but without complete loss of it. Pre-syncope can progress to syncope or end without becoming one.

Unexplained syncope is the latter that can remain without cause relation, even after the initial patient evaluation (medical history, physical exam, ECG).

Clinical forms of syncope:

Orthostatic intolerance which can be accompanied or not, by tachycardia or hypotension (classical, neurogenic, or delayed).

Cardiogenic syncope envelops:

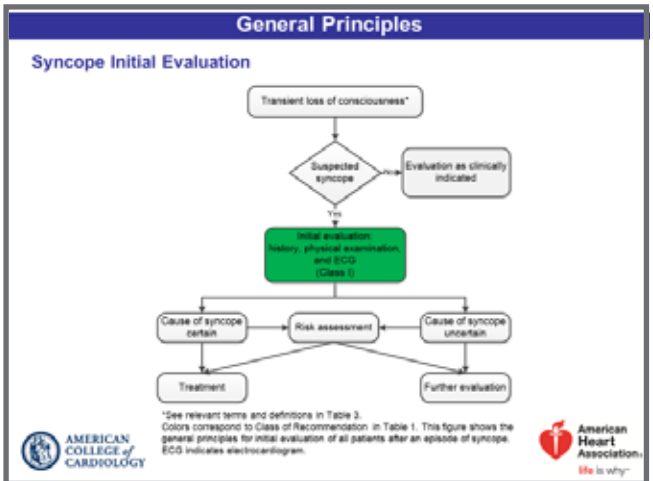
- Arrhythmias as a cause of syncope: bradycardia (sick sinus syndrome, AV disease), tachycardia (supraventricular, ventricular),
- Structural diseases: aortic stenosis, acute coronary syndrome, hypertrophic cardiomyopathy, pericardial diseases-tamponade, congenital heart disease, artificial heart valves, tumors of the heart, pulmonary embolism, pulmonary hypertension, aortic dissection.

Reflex syncope is caused by reflex vasodilation, bradycardia or both. These can be vasovagal (orthostatic, emotional), situational (urinary, gastrointestinal stimulation, after strenuous exertion, cough related, laughter related) and carotid sinus syndrome.

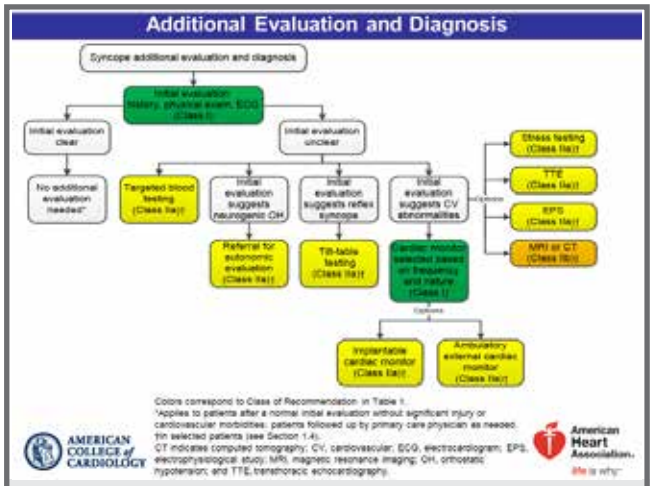
High probability of cardiac cause of syncope is in: 60 years of age and older, male sex, exertion syncope, or in supine position, short prodromes (palpitations), but also a sudden loss of consciousness without prodromes, smaller number of events e.g. one or two. These patients usually have an abnormal clinical finding on the heart, joined with structural heart disease, ischemic disease, already diagnosed arrythmias, reduced ejection fraction, and congenital heart disease.

Initial tests include medical history, physical exam and ECG (Graph 1.)

In case that the cause is not diagnosed, further diagnostic examination with the whole array of non-invasive tests is needed, along with multidisciplinary approach (Graph 2).



Graph 1: initial tests in patients with syncope



Graph 2: initial examination of patients with syncope

Case report

Male patient, 60 years old, is referred for the first time to Pacemaker Center Zajecar on 26th of July 2018. for assessment of possible indication for pacemaker implantation.

Initial evaluation

History: The patient is physically active, no limitation in exertion. He states that he had 3 episodes of loss of consciousness during the past year. Every time the event occurred during rest, while sitting or lying, every time he had a feeling of stomach upset before the event. On one occasion he was woken up from sleep with cold sweat and urination. So far he was treated for arterial hypertension, and is taking Perindopril 5mg and Amlodipine 10mg.

Clinical exam: conscious, orientated, afebrile, eupneic. Auscultatory finding for lungs was normal, for heart also. TA=130/80mmHg.

ECG: Sinus, left axis deviation, HR 60/minute, without excitation and conduction disturbance, without ST-T changings.

Additional evaluation

He has done a three **24-hour Holter recordings** with no significant disturbances in excitability or conductivity. Sinus bradycardia was found during sleep. During the day hours, a chronotropic competence is maintained.

Exercise test, that he has also done, is described as negative for ischemic disease, with preserved chronotropic competence.

Echocardiography described like normal finding.

Neurological exams: clinical finding is normal.

MRI of the head was done, also with normal findings.

Our conclusion after reviewing all of this was, that the cardiological and neurological work-up was adequate, and that due to unexplained syncope events an implantable loop recorder implantation was indicated. On 8th of October 2018. the patient was implanted with **implantable loop recorder** in left pectoral region, the device was Medtronic Reveal LinQ.

On 27th of February 2019. the patient comes for a regular electronic check up. During this period he had two syncopal episodes. On the other hand a device had a several pauses detection of which the longest was 45s in duration (during sleep) Picture 1.

One of the syncopal episodes when the patient had a loss of consciousness was during the day hours on 9th of January 2019. lasted for 35s.

Based on these recordings, an indication for pacemaker implantation was made. On 28th of February 2019. the latter was done. Biotronic DDDR device was implanted. Solia, atrial and ventricular active fixation leads, were used.

Discussion

Syncope is sudden, transient loss of consciousness with inability to maintain postural tone, which is provoked by impaired brain perfusion. In randomized patients over 45 years of age, syncope prevalence was 19%, more often in women, 22 vs 15%[3]. In emergency rooms 0.8 to 2.4% of all patients present with syncope[4]. It is estimated that they comprise about 6% of all hospitalized patients. In syncope patients over 80 years of age, hospitalization is indicated in 58% of the cases[5]. Not every loss of consciousness represents syncope, like head trauma, hypovolemia, or medication abuse. The most frequent of syncope are reflex, in 21% of patients, 9% of patients have orthostatic hypotension, and another 9% are cardiac syncope. Almost 36% are unknown in cause[6]. After the initial syncope, and first medical contact, an initial diagnostic is done, which encompasses medical history, clinical exam and ECG. If this is enough to find the cause, further treatment is etiology related. In case that the cause remains undetected, further investigation is needed with whole array of noninvasive tests, neurological exams along with neurology diagnostic work-up[1,2]. Even after complete diagnostic work-up, 47% of syncope remains unclear in origin. In our patient, the cause remained undetected after initial diagnostics, but also after complete array of non-invasive tests and neurological exams. The difficulty with this patient was that the syncope had no regularity, it was not provoked with certain behavior or habits, and on the other hand

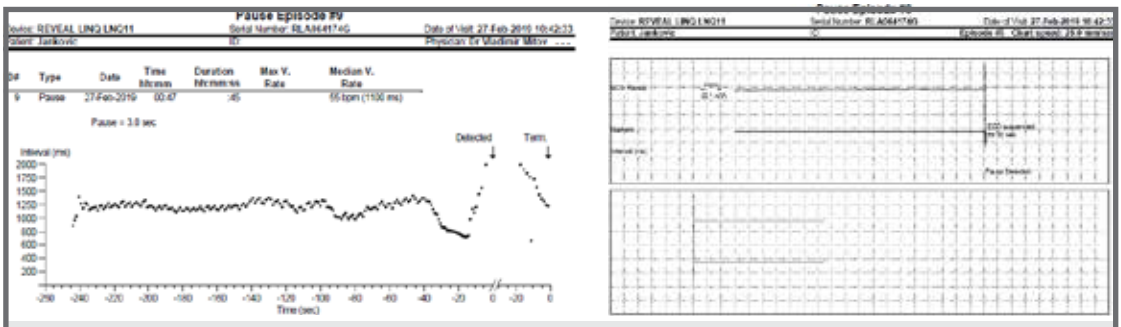


Figure 1. The longest asystole episode which was not accompanied by syncope because it occurred during sleep (picture 2)

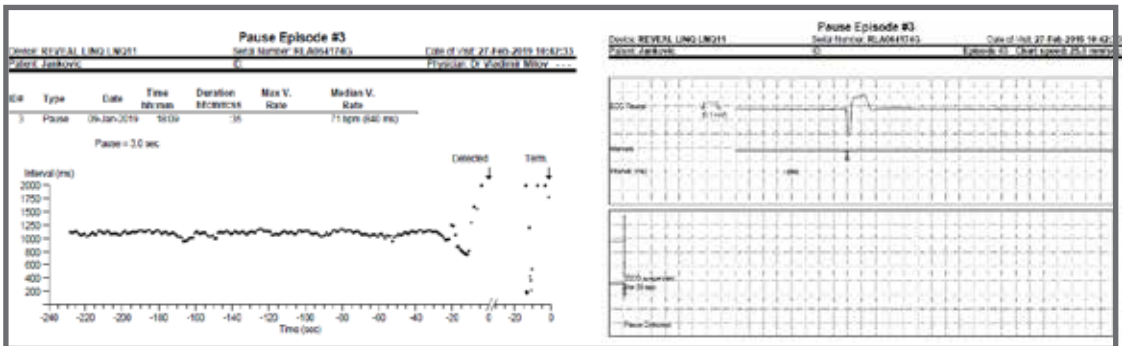


Figure 2. Asystole episode that happened when patient was awake and was followed by syncope.

had an occurrence rate of only 3 times in a year. All of the above characteristic pointed out high probability of cardiac syncope, which in turn led to indication for implantable loop recorder implantation. Loop recorder is an invasive ECG monitoring device enabling ECG event recording during the period of 2-3 years and is a method of choice for patients with low event rates, where all other methods failed in determining the cause of syncope. Loop recorder was useful for detecting ECG changes in 176 (35%) from 506 patients with unexplained syncope, 56% had asystole or bradicardia, 11% had tachycardia and 33% had no arrhythmia[8]. The main ECG diagnosis of arrhythmic syncope are prolonged asystole (>3 sec), rapid supraventricular tachycardias (>160 beats/min for >32 beats) or ventricular tachycardia[2]. In the ISSUE-3 trial with Implantable loop recorder indication for DDD pacemaker implantation was syncope with asystole over 3 sec, or asystole over 6 sec without syncope (9). Pacemaker implantation represents an etiology related and most adequate treatment in patients with syncope caused by bradyarrhythmia events[7].

Conclusions

Cardiac syncope represents a clinical and diagnostic challenge. An implantable loop recorder is an adequate diagnostic tool for cardiac syncope detection in patients with syncope of unknown origin. Pacemaker implantation is a permanent solution for treatment of cardiac syncope caused by bradyarrhythmia events.

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Sažetak

Sinkope

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Pacijent M.J. muškog pola 60 godina prvi put se javlja u Pejsmejker centar u Zaječaru 26.07.2018. zbog procene indikacije za implantaciju antibradikardnog pejsmejkera. Nakon inicijalne evaluacije (istorija bolesti, klinički nalaz, EKG) sa normalnim nalazima pacijentu su sprovedena dodatna klinička ispitivanja.
Donosi sa sobom tri 24h Holtera EKG: bez značajnih poremećaja u razdražljivosti i sprovodljivosti, sa sinusnom bradikardijom u toku sna, u toku dana adekvatne hronotropne kompetentnosti. Ergo test je opisan kao negativan na značajnu ishemiju, sa očuvanom hronotropnom kompetencijom. Eho srca je procenjen kao normalan. Neurološki nalaz u granicama normale, urađena NMR endokranijuma sa opisanim normalnim nalazom.Pacijentu je injektiran u levu prepektoralnu regiju Loop recorder Reweal Linq. Pacijent se javlja na redovni pregled Loop recordera kada su detektovane pause od kojih je najduža bila 45 sekundi. Na osnovu nalaza Loop rekordera indikovana je implantacija DDDR pejsmejkera.
***Zaključak:** Kardijalne sinkope predstavljaju veliki klinički i dijagnostički izazov. Loop recorder je adekvatno dijagnostičko sredstvo za identifikaciju kardijalnih sinkopa kod pacijenata sa sinkopama nepoznatog uzroka. Implantacija antibradikardnih pejsmejkera predstavlja trajno rešenje kardijalnih sinkopa koje su izazvane bradiaritmijama.*
***Ključne reči:** Sinkopa, Loop rekorder, Pejsmejker*