Accompanying the syncope: the use of indicators to reduce the risk involving cardiogenic syncope.

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Abstract. Syncope is a condition in which an individual loses its conscience for a short period of time due to a transitional brain hypoperfusion. Although pretty common over the population, its occurrence should be a concern for health professionals and for the population in general alike. Usually related with good outcomes, episodes of syncope may have a turnaround according to its cause and frequency of occurrence and, as such, in some instances, syncope events are quite serious due to the nature of their origin. Syncopes that relate to Neurological dysfunction or arterial hypotension are common, but the most dangerous cause of syncope events still are the ones caused by heart problems and failures, that occasionally end up in death. Those events must be accompanied by the professional health team to secure the best possible resolution to avoid tragic results, but there is not a worldwide standardised approach to guide professionals through syncope cases, and for this reason different countries adopt a different methodology to convoy professionals, not always having the same result. In this perspective, this paper proposes a mini-review of the indicators and methods that are used to relate the syncope episodes with its gravity, following different guidelines and approaches used by medical teams in Brazil and also in other countries.

Keywords. Syncope, Cardiac Failure, Medicine

1. Introduction

Syncope episodes are quite common across the population. It is presumed that 6,2 per 1000 persons will experience these events for the first time through the year [1], and between 27% and 41% of the population will experience at least one episode through its lifespan, varying according to the group [2]. This physiopathological malfunction is manifested upon well known symptoms such as a loss of consciousness and a loss of the postural tonus, which often are accompanied by prodomes - *a premonitory symptom of a disease* - like nausea, cold sensation, sweating, aura, dizziness and others.

The mechanism by which all syncope events happen is the same, it involves a hypoperfusion of the brain. This deficit of blood on the cerebral cortex is responsible for the transitional loss of consciousness. As soon as the blood flow is reestablished, the individual experiencing the Syncope will recover to the neurological baseline state by spontaneously means, without the need of therapeutic intervention from the medical team [2]. Just for reference, the mitigation of cerebral perfusion for 6 to 8 seconds is sufficient to make one lose consciousness [2].

While there is a single mechanism involving the occurrence of Syncope, its causes are not so explicit and may originate from a variety of different factors. In this way, often the syncope episode is not caused by a malignant disease, but occasionally it will be triggered by an important biological malfunction [3].

In the scenario of Syncope, the cause that will be experienced by most people is the one related to orthostatic hypotension, for example when one stays on feet for too long or gets up too quickly, it is possible to experience this type of faint. Other similar occurrences may also be related. This type of Syncope is usually of low risk and the person facing it should recover without any problems and there is no life risk involving this type of case [5]. The trouble begins when other causes of syncope are faced. Episodes related with a disturbance of the

neurological system or the cardiovascular system are more worrisome. These factors are related with deeper meanings that should trigger the alert on the medical team that is assisting the patient [4].

Cardiogenic syncope is the most dangerous of them all. Some studies point out that 30% of the cases originating from a cardiac malfunction will end up in death within one year of the first faint episode [5]. Factors such as age, anatomic alterations and use of medicines are common in persons facing a syncope for the first time [6]. The correlation of those factors is responsible for the death of hundreds of people across the globe, and in Brazil alone between the year of 2015 and 2021, more than 150 persons died of causes strictly related to syncope episodes [7].

In the face of the gravity involving those cases, it is important that Emergency Teams, and all healthy professionals alike, handle the situation in the best possible manner, to ensure a good outcome even before a bad prognosis. Besides the importance of a systematic approach to those cases, there isn't a definite form of evaluating those cases, and so, different countries may have a different approach to target the problem. In this paper some of those approaches - that have been the theme of discussion in other papers - will be discussed.

2. Methodology

Many studies have been carried out to analyse the advantages of using determined protocols when treating patients that have experienced a syncope episode, whether in an emergency or in a physician's office. As such, there is a rough guideline to be followed in those cases, but the approaches vary between different professionals, healthy services and countries' healthy guidelines.

For this reason, this work will analyse three different methods used to examine individuals that had a syncope episode recently, especially focusing on the outcomes of the ones caused by cardiovascular events. The first one is the Guideline published by the American College of Cardiology (ACC), American Heart Association (AHA) and the Heart Rhythm Society (HRS) in the year 2018 [8]. Followed by the usage of the Canadian Syncope Risk Score (CSRS) [9] and ending with the Osservatorio Epidemiologico della Sincope nel Lazio Score (OESIL).

It is important to emphasise that this work is not a clinical trial. It is an analysis of papers already published and available in scientific databases.

3. Results and discussion

As addressed before, this paper will analyse the use of three different methods to evaluate the patient with a Syncope Crisis: the ACC/AHA/HRS guideline, the CSRS score and also the OESIL score. However, before jumping to the analysis, it is necessary to get a quick review of the predominant causes of the Cardiovascular syncope.

There is a number of heart related factors that can be the origin of a syncope event, they are listed below [10]

- Arrhythmia
  * Bradycardia: Sinus or AV Conduction Disease;
  * Tachycardia: Supraventricular or Ventricular.
- Structural
  * Tamponade;
  * ACS (Acute Coronary Syndrome);
  * Aortic Stenosis;
  * HCM (Hypertrophic Cardiomyopathy);
  * Cardiac Mass;
  * Prosthetic Valve Dysfunction.
- Cardiopulmonary
  * PE (Pulmonary Embolism);
  * Aortic Dissection;
  * Pulmonary Hypertension.

Having addressed the main causes of a cardiac syncope, the next step is to analyse the methods used by healthcare professionals and services to understand the meaning of the symptoms to the patient.

3.1 ACC/AHA/HRS Guidelines

Published in 2018 and elaborated by the conjunction work of ACC, AHA and HRS, the "Guideline for Evaluation and Management of Patients With Syncope" is mainly used by professionals in the United States of America. Its use is focused on adult and paediatric patients.

The baseline of this guideline is to recommend that every patient presenting a syncope episode should undergo a physical examination as well as a check up of its detailed history. In this way, health professionals should be able to identify the gravity of the case. It is also recommended that all patients should do a resting 12-lead electrocardiogram (ECG), because, in many cases, problems related to a cardiac syncope may be found in this type of exam. For an example, the picture below reports a 60 years old patient who had chest pain followed by an syncope, indicating that the occurrence of the episode is related to a heart dysfunction [11].

Fig. 1 - ECG of a patient with chest pain and syncope.

Following the advice indicated by the ACC/AHA/HRS, it is important that the doctor

analysing the ECG observes some aspects of the exam. The professional main concern should be in analysing the heart rhythm, the electrical conduction, the axis presented on the ECG, the R wave, the tension and abnormalities on the ST/T waves [12].

If the case presents a bad prognosis, the patient should be admitted to further examination.

Although good to guide professionals when they face a syncope scenario, this guideline does not provide other parameters to be used for the clinical evaluation.

3.2 Canadian Syncope Risk Score

The Canadian Syncope Risk Score (CSRS) has been proposed for syncope risk stratification at emergency departments. It was derived from 4.030 patients with syncope and is currently undergoing validation. It can be used to identify medium and high risk patients and would help to determine the necessity of hospitalisation.

For its use, the professional must understand if the patient has a predisposition to Vasovagal Symptoms, any history of heart disease, a systolic pressure inferior to 90 mmHg or superior to 180 mmHG, an elevated troponin level, an abnormal QRS axis on the ECG, a QRS duration bigger than 130 ms, a corrected QT interval bigger than 480 ms and if there has been a diagnosis of vasovagal syncope or cardiac syncope on the emergency department [13].

The analysis of those parameters will indicate the gravity of the case, rating the patient on a scale from 0 to 8. The lower being considered of low risk and higher being of very high risk for serious adverse events in the following 30 days [13].

This score presents itself as a good guide upon which health professionals can rely to get the best conduct for the patient. It also is of easy use, since it can be calculated with a calculator available on-line, as shown below.

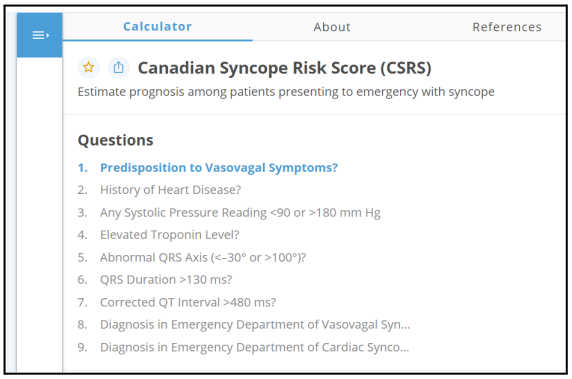

Fig. 2 - CSRS Calculator.

It is also important to note that many studies are being conducted for the real world evaluation of this tool. They mostly show that there are some real advantages to using it to guide a patient's treatment [14].

3.3 Osservatorio Epidemiologico della Sincope Nel Lazio Score

The Osservatorio Epidemiologico della Sincope Nel Lazio Score was created in Italy in the Lazio region by gathering information of 6 different community hospitals in the region. It was created in the late 1990s, utilising a sample of 270 patients presenting syncope event. When it was developed, it was planned to be a simple score that could demonstrate the death risk in patients with syncope in the following twelve months of its first occurrence.

This simple tool utilised by emergency departments analyses four parameters on the patient and when the parameter is true for the individual it gets scored in a scale that goes from 0 to 4. 0 is the lowest score and 4 is the highest.

The score look to the patient's age, if it is 65 years old or more it gets scored; if it has an cardiovascular history of any disease - like a structural disease, CFD or HIA - it gets scored; if the syncope wasn't preceded by any prodomes, the patient score yet another point; if the ECG get to point any abnormality, the patient score another point [15]. Having this score will help the emergency team to think about the right procedure regarding the patient.

When it was first released its use was widespread, including in Brazil. The main attraction of the OESLS score is its ease of use and simplicity, all together with an extensive review in the literature about its importance and effectiveness in the emergency department of any hospital.

4. Conclusion

Any systematic abordage is helpful when handling patients with syncope in the emergency room or in the medical consultory. The use of guidelines and scores should help any health professional to ensure that the best approach is being taken to get the patient the better possibility to overcome the disease.

In this scenario, the use of any of the scores/guidelines presented here in this work will benefit the professional, especially when dealing with syncope episodes that are related to a heart dysfunction.

Although they are all important, it would be of great value to know which of them offer the best benefit when used in real world application. While one of them is really simple to use and has been proved to be useful (OESIL Score), the other one offers a more detailed medical review that will help to know the best approach to save the patient (CRSC).

The paper that compares all of those scores, to know which of them offers the best advantages, is yet to be published. Because this kind of work is unavailable, it is impossible to determine which one of them is the one that best suits professionals around the

globe.

A cohort study comparing them would be very useful to the medical community.

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