

## The Etiology of Syncope in an Emergency Hospital

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**Background.** Syncope is a commonly encountered problem in an emergency hospital. Global cerebral hypoperfusion is the final pathway common to all presentations of syncope, but this symptom presentation has a broad differential diagnosis. It is important to identify patients for whom syncope is a symptom of a potentially life-threatening condition.

**Material and methods.** We identified adult patients presenting with syncope to the Emergency Department of our hospital from January 2012 to June 2014. Of 590 patients found in the hospital database we further selected 217 patients who met our criteria, namely having a positive diagnosis of syncope (being clearly distinguished from other TLOCs) and an etiology of the disease. Thus, definite diagnosis was established retrospectively by reviewing medical records.

**Results.** The demographics of our group shows a slightly different distribution between men and women (49% men and 51% women) and a majority of the urban population (67%). As for the age range, most of our patients were in the age group of 70-80 years (30%), 29% were > 80 years old, and the percentage decreases significantly in the 60-70 years range (17%). The most frequent causes of syncope were cardiac (32%), vasovagal (23%) and due to orthostatic hypotension (12%), but we have also found various cases of mixt or iatrogenic causes.

**Conclusions.** The incidence of syncope increases sharply after 70 years of age and poses special consideration in light of multiple comorbid conditions, age-related changes, atypical presentation, and concomitant medication use. The most common causes of syncope in this population are cardiac causes, orthostatic hypotension and carotid sinus hypersensitivity. Often, root cause of syncope remains undiagnosed, despite exhaustive diagnostic testing.

**Key words:** syncope, emergency, hypotension, vasovagal, iatrogenic causes.

### INTRODUCTION

Syncope is defined as loss of consciousness due to transient global cerebral hypoperfusion characterized by rapid onset, short duration and spontaneous complete recovery [1].

Syncope is relatively common in an emergency hospital setting –its prevalence being approximately 1% to 2% of all emergency department visits, and accounts for roughly the same percentage of hospital admissions [2, 3].

A common presenting problem to health care systems, syncope creates several diagnostic and disposition challenges for the emergency physician [4]. It is important to identify patients for whom syncope is a symptom of a potentially life-threatening condition. In the majority of patients, the cause of syncope is relatively benign, and a strategy based on patient education and prevention of recurrences is sufficient, but in a few patients syncope portends serious disease and a worrisome prognosis. Differentiating these two groups, and determining the basis for symptoms with sufficient confidence to assess prognosis and initiate effective therapy is the essential management goal [5].

The management of syncope imposes a considerable socioeconomic burden [6] and remains largely unsatisfactory because of the presence of a significant gap between knowledge and its application, at least in Romania. Syncope represents a multidisciplinary problem and future efforts to address the improvement of this approach should be made.

This paper comes as an attempt to emphasize the importance of syncope, as a multidisciplinary problem, considering the variety of causes that can lead to this pathology. As far as our country is concerned, there is no data regarding its prevalence and therefore this study should be a step towards an awareness of the need for more attention to a disease that still remains underdiagnosed.

### MATERIAL AND METHODS

#### STUDY POPULATION

The study group was established retrospectively by reviewing medical records and 590 adult patients were identified with a diagnosis of syncope, who were admitted to the Clinical Emergency Hospital of Bucharest from January 2012 to June 2014.

## CRITERIA FOR INCLUSION IN THE STUDY

We selected 217 patients who met our criteria based on the European Society of Cardiology guidelines (2009) [1], namely having a positive diagnosis of syncope (being clearly distinguished from other TLOCs) and an etiology of the disease, meaning they were fully investigated and the diagnostic steps were correctly followed.

Every patient who met our criteria also had a signed informed consent which would allow us to use their medical data for scientific purpose, with their personal data being held confidential.

## STATISTICAL ANALYSIS

Data were analyzed with a statistical analysis software program: IBM SPSS Statistics version 20. Descriptive statistics values were given as mean  $\pm$  standard deviation and percentage ratios. For comparison of the categorical variables we performed chi-square test. The differences between numerical and categorical variables were expressed using the Mann-Whitney test. The  $p$  values  $< 0.05$  were considered statistically significant.

## RESULTS

## DEMOGRAPHICS

In our hospital, an emergency hospital of grade zero, there have been admitted a number of 30.755 patients on the medical ward (cardiology, gastroenterology, neurology and internal medicine) during January 2012 – July 2014. Out of these patients, 217 had a diagnosis of syncope which corresponds to a percent of admissions of 0.71%. The majority of these patients were admitted to the internal medicine and cardiology ward, while only a few were in the neurology ward.

The demographics of our group show a slightly different distribution between men and women (49% men and 51% women,  $p = 0.839$ ) and a majority of the urban population (67%). As for the age range, most of our patients were  $> 70$  years old (59.44%) and the percentage decreased significantly in the 60-70 years range (17.51%).

As shown in Figure 1, there was a significant difference between men and women in every age group ( $p = 0.014$ ), with a majority of women in the groups over 70 years (17.51%), which represent the majority of our patients.

Regarding age groups, in our study the prevalence of syncope increases sharply after 60 years (Figure 2).

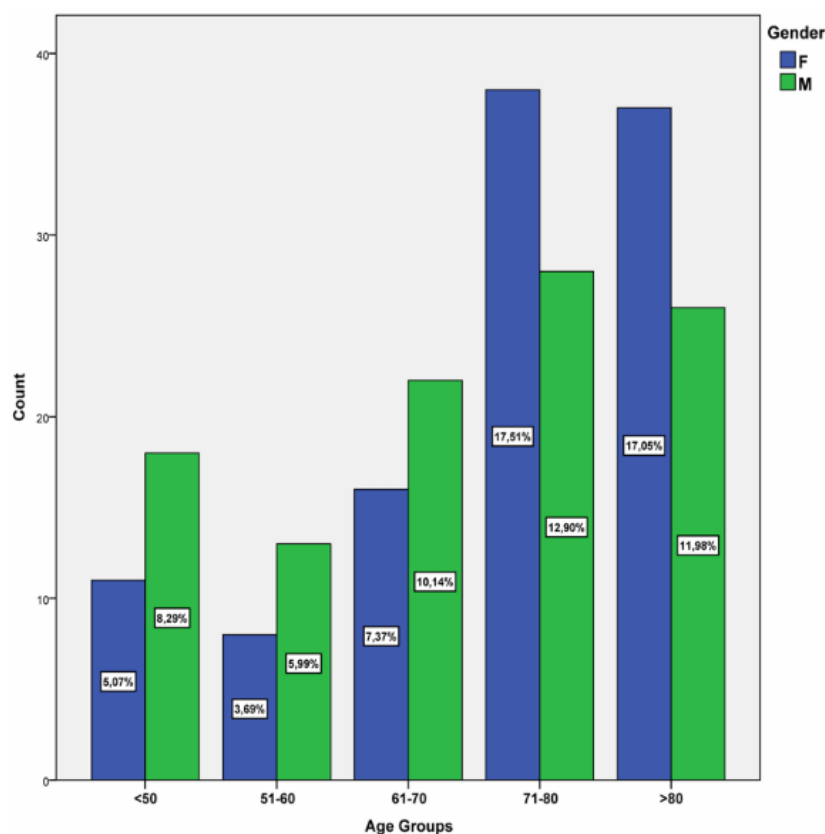


Figure 1. Comparison of the distribution of age groups between men and women in the study.

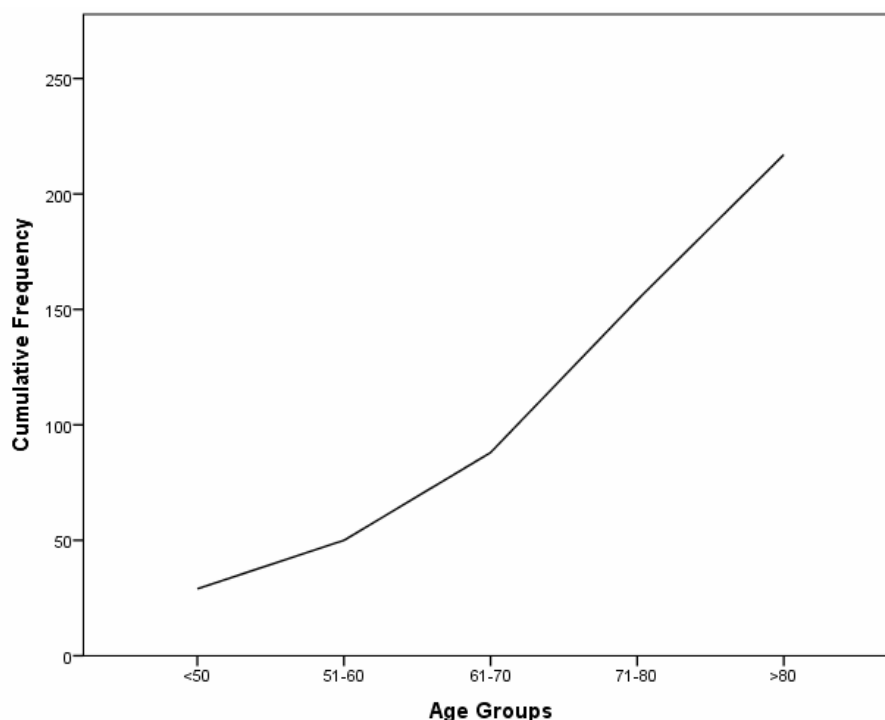


Figure 2. The prevalence of syncope etiology in the study.

#### ETIOLOGY OF THE DISEASE

The most frequent causes of syncope, as shown in Figure 3, were arrhythmic (32.3%), vasovagal (24%) and secondary to orthostatic hypotension (12.4%), but we have also found various cases of mixed (6.5%) or iatrogenic (9.7%) causes.

As far as cardiac causes are concerned, the most common in our study group were abnormalities in AV conduction (complete AVblocks – 19%), followed by tachyarrhythmia (19%) such as atrial fibrillation (10%), atrial flutter or other atrial tachycardia. There have also been noted numerous cases of sinus node disease (13%) or other blocks – fascicular blocks (12%).

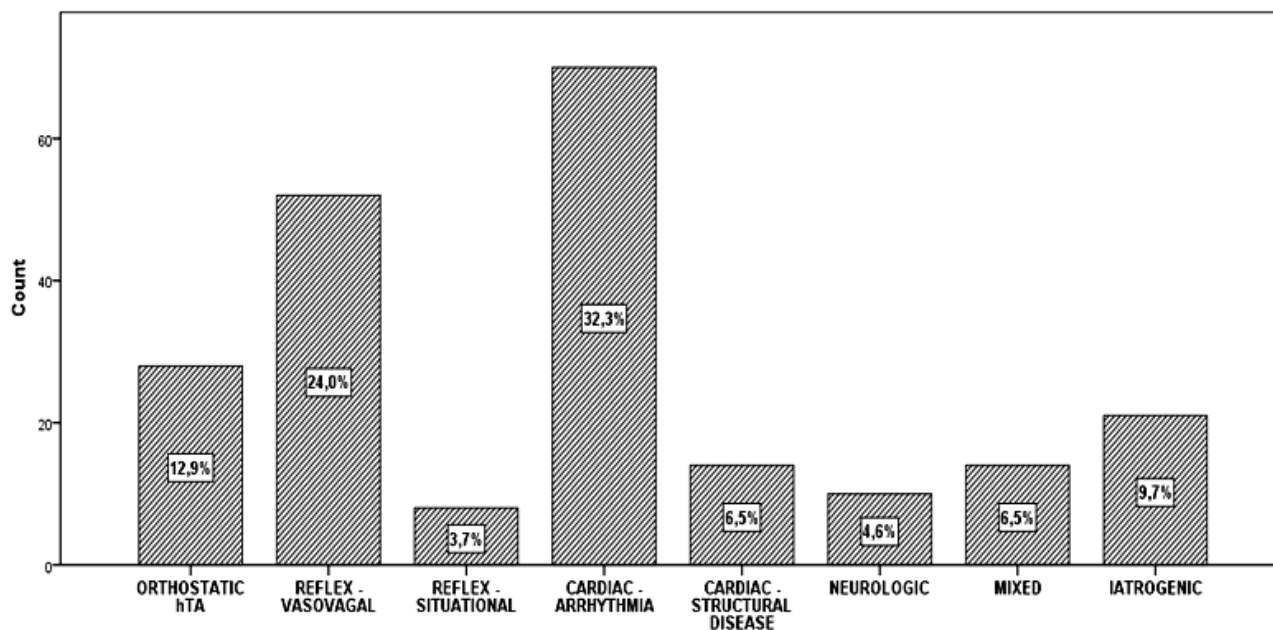


Figure 3. Etiology of syncope in the study.

## ANALYSIS

The correlation between gender and the etiology of syncope is illustrated in Figure 4 and the analysis of this correlation shows a significant difference between men and women ( $p = 0.286$ ).

The same analysis was made regarding age groups and etiology and the result shows that there is a significant difference ( $p < 0.001$ ).

Table 1 illustrates a correlation between the etiology of syncope and the age of the patient

showing a close relation between the age over 60 years and arrhythmic causes.

When analyzing the associated major risk factors for long-term severe outcomes in our study group, as assessed by Costantino *et al.* [7], we have found age  $> 65$  (64.52%), abnormal ECG (61.29%), hypertension (49.31%), structural heart disease (20.28%), cerebrovascular disease (17.05%), heart failure (14.29%), ventricular arrhythmias (4.61%) and COPD (1.38%). These results are illustrated in Table 2.

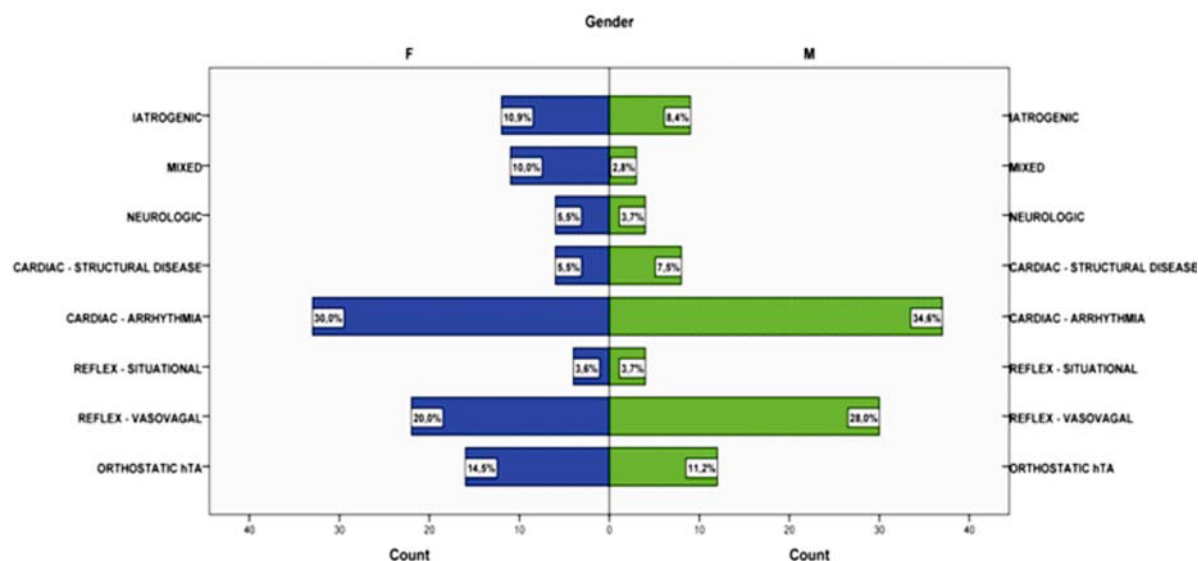


Figure 4. Etiology of syncope by gender in the study.

Table 1  
Correlation between age group and etiology in the study group

		Age Groups				
		<50	51-60	61-70	71-80	>80
ETIOLOGY	ORTHOSTATIC hTA	4	2	5	5	12
	REFLEX - VASOVAGAL	18	9	7	13	5
	REFLEX - SITUATIONAL	2	0	3	2	1
	CARDIAC - ARRHYTHMIA	2	6	12	31	19
	CARDIAC - STRUCTURAL DISEASE	0	1	3	6	4
	NEUROLOGIC	2	1	1	2	4
	MIXED	1	0	1	3	9
	IATROGENIC	0	2	6	4	9
Total		29	21	38	66	63

Table 2  
Major risk factors for long-term severe outcomes [7] in the study group

		Severe outcomes	
		n	%
RISK FACTORS	AGE >65	140	64.52%
	HYPERTENSION	107	49.31%
	ABNORMAL ECG	133	61.29%
	STRUCTURAL HEART DISEASE	44	20.28
	CEREBROVASCULAR DISEASE	37	17.05%
	HEART FAILURE	31	14.29%
	VENTRICULAR ARRYTHMIA	10	4.61%
	COPD	3	1.38%
Total		217	

## DISCUSSION

To our knowledge, this is the first study in Romania which tried to describe the causes of syncope in a selected population admitted to an emergency hospital over a period of two years. It shows that syncope contributes for 0.71% of admissions on the medical ward and as expected, the number of patients admitted increases sharply after 60 years, as it was also remarked by Blanc *et al.* [8]. And for this reason, it poses special consideration in light of multiple comorbid conditions, especially uncontrolled hypertension and history of heart failure [6]. Wagner *et al.* [9] found that advanced age and history of cardiovascular comorbidities are independent predictors for hospitalization, characteristics that can also be found in our study population (Table 2).

The most common causes of syncope in this population were arrhythmic, vasovagal and due to orthostatic hypotension, different from international data [1] or from a study conducted in a non-emergency hospital in Bucharest, where reflex syncope appears to be the most common cause [6]. To explain these results, we consider several factors: the specific population addressing our service (mostly elderly patients with cardiovascular diseases), the specific criteria for the inclusion in the study group (i.e. having an identified etiology of syncope) and the lack of means for complete investigations, having to redirect the patient to other hospitals.

It is important to notice that arrhythmic and vasovagal causes are more common in men and elderly (70-80 years), while orthostatic hypotension

is more common in women and over 80 years. These results may have important clinical implications as they show that one should pay more attention when facing the clinical presentation of syncope as this “symptom” may be just the tip of the iceberg and it is known that persons with cardiac syncope are at increased risk for death from any cause and cardiovascular events [10].

The limits of our study are due to the small number of patients, the selected population included in the study and also the specific group addressing our service. Also, not all patients presenting with syncope at the emergency department were admitted, due to the specific emergency criteria for admission. Thus, after the evaluation at the emergency department, many of the patients are referred to other hospitals or ambulatory evaluation or the diagnosis was certain after the first evaluation and the patient was sent home with the correct treatment suggestions.

## CONCLUSIONS

The most common etiology of syncope in an emergency hospital is arrhythmic, but reflex syncope also counts for many of the presentations to the emergency department. The present study comes as a reminder of the importance of syncope and the need of multidisciplinary approach when facing this particular “symptom”, as syncope is associated with a high rate of hospitalization and may be just the tip of the iceberg.

The author claims **no conflict of interest**.

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**Introducere.** *Sincopa este o problemă frecvent întâlnită într-un spital de urgență. Hipoperfuzia cerebrală globală este calea finală comună pentru toate prezentările de sincopă, dar acest simptom are un diagnostic diferențial larg. Este important să se identifice pacienții a căror sincopă este un simptom al unei afecțiuni amenințătoare de viață.*

**Materiale și metode.** *Am identificat pacienți adulți care se prezintă cu sincopă la camera de gardă a spitalului nostru din ianuarie 2012 până în iunie 2014. Din 590 pacienți găsiți în baza de date a spitalului, am ales 217 pacienți care au îndeplinit criteriile noastre, și anume care au un diagnostic pozitiv de sincopă (fiind diferențiați clar de alte TLOCs) și o etiologie a bolii. Astfel, diagnosticul de certitudine a fost stabilit retrospectiv prin revizuirea fișelor medicale.*

**Rezultate.** *Datele demografice ale grupului nostru prezintă o distribuție ușor diferită între bărbați și femei (49% bărbați și 51% femei), precum și o majoritate a populației urbane (67%). În ceea ce privește intervalul de vârstă, cei mai mulți dintre pacienții noștri au fost în grupul de vârstă de 70-80 de ani (30%), 29% au*

fost >80 de ani, iar procentul scade semnificativ în intervalul 60-70 de ani (17%). Cele mai frecvente cauze de sincopă au fost cardiace (32%), vaso-vagale (23%) și din cauza hipotensiunii ortostatice (12%), dar am găsit de asemenea diferite cazuri de cauze mixte sau iatrogene.

**Concluzii.** Incidența sincopei crește brusc după 70 de ani și necesită o atenție specială prin prisma multiplelor comorbidități care o însoțesc, a modificărilor legate de vârstă, prezentării atipice și a plurimedicatiei. Cele mai frecvente cauze de sincopă în această populație sunt cauze cardiace, prin hipotensiune ortostatică și hipersensibilitatea sinusului carotidian. De multe ori, pacienții rămân nediagnosticați, în ciuda testelor exhaustive de diagnostic.

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#### REFERENCES

1. MOYA A., SUTTON R., AMMIRATI F., et al. *Guidelines for the diagnosis and management of syncope (version 2009)*. Eur Heart J. 2009; 30:2631-71.
2. EASTON J.D., SAVER J.L., ALBERS GW., et al. *Definition and evaluation of transient ischemic attack: a scientific statement for healthcare professionals from the American Heart Association/American Stroke Association Stroke Council; Council on Cardiovascular Surgery and Anesthesia; Council on Cardiovascular Radiology and Intervention; Council on Cardiovascular Nursing; and the Interdisciplinary Council on Peripheral Vascular Disease. The American Academy of Neurology affirms the value of this statement as an educational tool for neurologists*. Stroke 2009; 40:2276-93.
3. CASTLE J., MLYNASH M., LEE K., et al. *Agreement regarding diagnosis of transient ischemic attack fairly low among stroke-trained neurologists*. Stroke 2010; 41:1367-70.
4. BRIGNOLE M., ALBONI P., BENDITT D., et al. *Guidelines on management (diagnosis and treatment) of syncope*. Eur Heart J. 2001; 22:1256-306.
5. JHANJEE R., VAN DIJK G., SAKAGUCHI S., BENDITT D. G. *Syncope in adults: terminology, classification and diagnostic strategy*. Pacing Clin Electrophysiol. 2006; 29(2):1160-1169.
6. BUZEA C.A., DAN A.R., DAN G.A. *Incidence and hospitalization rate of syncope in a non-emergency hospital*. Romanian Journal of Neurology 2013; 13:113-7.
7. COSTANTINO G. et al. *Short- and long-term prognosis of syncope, risk factors, and role of hospital admission results from the STePS (Short-Term Prognosis of Syncope) study*. J Am Coll Cardiol. 2008; 51(3):276-83.
8. BLANC J., et al. *Prospective evaluation and outcome of patients admitted for syncope over a 1 year period*. Eur Heart J. 2002; 23: 815-20.
9. WAGNER P., BUCHER H.C., BUCHELI B., BATTEGAY E., MARTINA B. *Predictors of hospitalization in emergency department patients with syncope*. Eur J Int Med 2002; 11:39-44.
10. SOTERIADES E.S., et al. *Incidence and prognosis of syncope*. N Engl J Med 2002; 347:878-85.

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