



BRIEF COMMUNICATION

Syncope: clinical-epidemiological study in pediatric patients. "Hermanos Cordové" Hospital in Manzanillo, Granma

Victor José Arjona-Labrada¹ , **Daimy Rosa Vega-Vargas¹** , **Yunior Meriño-Pompa²** , **Sulanys Yainet Naranjo-Vázquez²** , **Niurka María Escalona-Zaldívar¹** , **Delmis Esther Montero-Verdecia²** 

¹"Hermanos Cordové" Children's Hospital in Manzanillo, Granma, Cuba.

²University of Medical Sciences of Granma. "Celia Sánchez Manduley" Faculty of Medical Sciences in Manzanillo. Granma, Cuba.

ABSTRACT

Introduction: syncope constitutes a transient loss of consciousness caused by global cerebral hypoperfusion, characterized by rapid onset, short duration, and complete spontaneous recovery.

Objectives: to characterize, from a clinical and epidemiological standpoint, pediatric patients diagnosed with syncope.

Methods: an observational, descriptive, cross-sectional study was conducted in pediatric patients who presented with syncope and were treated at the "Hermanos Cordové" Hospital in Manzanillo, Granma, during 2023. The universe consisted of 40 pediatric patients who presented with syncope, from which a sample of 33 patients was selected through intentional non-probabilistic sampling. Descriptive statistical methods were used for data analysis, respecting the principles of medical ethics.

Results: there was a predominance of the female sex (57,6 %) and adolescent ages. Fainting was the cardinal symptom in 63,6 % of patients. Most cases showed no electrocardiographic abnormalities (51,5 %). Vasovagal syncope was the most frequent (66,7 %), with hygienic-dietary treatment being the most used in these patients (5,5 %).

Conclusions: syncope is an important and common clinical problem in the pediatric population, being more frequent in females and adolescents. The electrocardiogram was fundamental in the evaluation of patients who presented, allowing findings to suggest an underlying cardiac cause. Management sought to stratify patient risk and the underlying pathophysiological mechanisms in order to address the underlying disease causing the syncope.

Keywords: Consciousness; Fainting; Electrocardiogram; Children; Syncope; Vasovagal Syncope.

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INTRODUCTION

Syncope is described as a temporary loss of consciousness produced by a decrease in blood flow to the brain, characterized by rapid onset, short duration, and complete and spontaneous recovery.^(1,2,3) Its mechanism is based on a reduction in cardiac output, body blood vessel resistance, or both, leading to a decrease in systolic blood pressure (less than 60 mmHg over a period of 6-8 seconds). This considerably decreases total cerebral blood flow, with hypoperfusion of the ascending reticular activating system (ARAS) (less than 40 mmHg of blood pressure). This causes an immediate loss of the level of alertness known in English as "*arousal*," which means the shutting down of consciousness.^(4,5)

The elimination of the factor or agent triggering the reduction in cardiac output or vascular resistance gives rise to the recovery of systemic blood pressure, together with the restoration of cerebral blood flow, including the brainstem, and the resumption of ARAS functioning.^(4,5)

Syncope may originate from three distinct etiologies: a reflex or neurally mediated mechanism; a cardiogenic origin that may be produced by an arrhythmia or some type of structural heart disease; or orthostatic hypotension that may result from primary autonomic dysfunction, consequently from an underlying disease, or caused by hypotensive drugs or hypovolemia. It is crucial to highlight that more than one mechanism often participates in a syncopal episode.^(6,7,8)

The Spanish Society of Cardiology (SEC) has established the definition of presyncope, understood as the set of signs and symptoms that occur before loss of consciousness. The most frequent causes of presyncopal episodes are generally non-cardiac and may include vasovagal or neuro-cardiogenic episodes with symptoms such as nausea, flushing, sweating, blurred vision, and dizziness.⁽⁶⁾

Syncope is a frequent reason for visits to clinics and hospitals, where it accounts for one percent of all consultations. Reflex syncope is the most common mechanism, and within this, vasovagal syncope accounts for 60 % of consultations. It has a prevalence in young ages and in women. The first episode occurs between 10 and 30 years of age.⁽⁶⁾ Approximately 15 to 25 % of the pediatric population experiences a syncopal episode, especially adolescent women. Likewise, these are events that generate great anxiety in patients and their families, which explains their consideration as a frequent reason for consultation in pediatric emergency services (1-3 %).^(9,10,11)

Most syncopes are vasovagal (21,1 %), followed by cardiogenic (9,5 %) and orthostatic (9,4 %); about one third (36,6 %) are classified as idiopathic. Some more recent studies suggest that syncope accounts for 3 % to 5 % of total emergency department admissions, with an average hospitalization rate of 40 % and a mean stay of 5,5 days.⁽⁹⁾

It is estimated that syncope occurs at least once in a lifetime in 32 to 35 % of the population in Canada and the Netherlands. Syncope motivates more than 1 million emergency department visits per year in the United States alone, and one third of patients are hospitalized. In that country, care for patients admitted for this cause generates an average annual expenditure of 2,4 billion dollars.⁽⁴⁾

Syncope should be classified as a frequent disease that must be investigated from a clinical and epidemiological perspective for an etiological approach. It is frequently associated with disability; moreover, these patients may present traumatic injuries, and in some cases it presents as the only warning sign prior to sudden cardiac death. Based on the foregoing, the authors of the present study set as their objective to characterize, from a clinical and epidemiological standpoint, pediatric patients diagnosed with syncope.

METHODS

An observational, descriptive, retrospective, cross-sectional study was conducted in pediatric patients who presented with syncope and were treated at the "Hermanos Cordové" pediatric hospital in Manzanillo, Granma, during 2023. The universe consisted of 40 pediatric patients who presented with syncope, from which a sample of 33 patients was selected through intentional non-probabilistic sampling. For this purpose, the following selection criteria were met:

- Inclusion criteria: pediatric patients diagnosed with syncope treated at the "Hermanos Cordové" pediatric hospital in Manzanillo, Granma, during the period from January to December 2023.
- Exclusion criteria: patients whose parents refused to grant consent to participate in the study.

The following variables were studied: [sex (male or female); age (under four years, 5-9, 10-14, and 15-19); symptoms (fainting, loss of consciousness, blurred vision, sweating and coldness, precordial pain, nausea or vomiting, malaise, palpitations, loss of muscle strength, and epigastralgia); treatment used (hygienic-dietary, lithium carbonate, phenobarbital, propranolol, sodium valproate, and verapamil)]; definitive diagnosis at discharge (vasovagal syncope, vasovagal presyncope, orthostatic hypotension, arterial hypotension, sinus bradycardia, supraventricular rhythm disorder, non-cardiogenic precordial pain, mild anterior mitral valve prolapse, and cardiogenic syncope); electrocardiographic findings (normal, respiratory sinus arrhythmia, sinus bradycardia, vagotonic, microvoltage, ST elevation in DII and V6 at 2 mm with mirror image in aVR, regular rhythm, supraventricular extrasystole with R-on-T phenomenon, low atrial rhythm, deep P wave, sinus rhythm, early repolarization, and sinus rhythm).

For data collection, individual clinical histories of the patients (ICH) were reviewed, and a bibliographic review of materials and sources on the different aspects addressed in the research was carried out. For data analysis, descriptive statistics were used by calculating absolute and relative percentage frequencies.

Regarding ethical considerations, informed consent was requested from the participants. The research was conducted with the approval of the Ethics Committee and Scientific Council of the Hermanos Cordové Hospital. The ethical principles of autonomy, protection, beneficence, non-maleficence, and justice were also taken into account. In addition, the principles declared in the Declaration of Helsinki for the development of research in human beings were applied.

RESULTS

Table 1 shows that 39,4 % of pediatric patients were between 10 and 14 years of age and that there was a predominance of the female sex, accounting for 57,6 % of the total.

Table 1. Distribution of patients according to age groups in years and sex.

Age	Sex		Total
	Female	Male	
	No. (%)	No. (%)	
0-4	0 (0)	2 (6,1)	2 (6,1)
5-9	5 (15,2)	5 (15,1)	10 (30,3)
10-14	6 (18,2)	7 (21,2)	13 (39,4)
15-19	8 (24,2)	0 (0)	8 (24,2)
Total	19 (57,6)	14 (42,4)	33 (100)

Table 2 shows that 63,6 % of patients with syncope presented fainting as the cardinal symptom and that 60,6 % also exhibited loss of consciousness.

Table 2. Distribution of patients according to symptoms.

Síntomas	No. (%)
Symptoms	21 (63,6)
Fainting	20 (60,6)
Loss of consciousness	9 (27,3)
Blurred vision	9 (27,3)
Sweating and coldness	9 (27,3)
Precordial pain	6 (18,2)
Nausea and vomiting	3 (9,1)
Malaise	3 (9,1)
Palpitations	1 (3,0)
Loss of muscle strength	1 (3,0)

Table 3 shows that 51,5 % of patients had normal electrocardiographic findings.

Table 3. Distribution of patients according to electrocardiographic findings.

Electrocardiographic findings	Age				Total
	0-4 year	5-9 year	10-14 year	15-19 year	
	No. (%)	No. (%)	No. (%)	No. (%)	
Normal	2 (6,1)	5 (15,1)	6 (18,2)	4 (12,1)	17 (51,5)
Respiratory sinus arrhythmia	0 (0)	3 (9,1)	2 (6,1)	0 (0)	5 (15,2)
Sinus bradycardia	0 (0)	0 (0)	3 (9,1)	1 (3,0)	4 (12,1)
Vagotonic	0 (0)	1 (3,0)	1 (3,0)	0 (0)	2 (6,0)
Microvoltage, ST elevation in DII and V6 at 2 mm with mirror image in aVR	0 (0)	1 (3,1)	0 (0)	0 (0)	1 (3,1)
Regular rhythm, supraventricular extrasystole with R-on-T phenomenon, low atrial rhythm	0 (0)	0 (0)	0 (0)	1 (3,0)	1 (3,0)
Deep P wave. Sinus rhythm	0 (0)	0 (0)	0 (0)	1 (3,0)	1 (3,0)
Early repolarization	0 (0)	0 (0)	0 (0)	1 (3,1)	1 (3,1)
Sinus rhythm	0 (0)	0 (0)	1 (3,0)	0 (0)	1 (3,0)

Table 4 shows that 66,7 % of patients had vasovagal syncope as the definitive diagnosis at discharge, and of these, the most used treatment was hygienic-dietary, applied in 54,5 % of patients with this diagnosis.

Table 4. Distribution of patients according to definitive diagnosis at discharge and treatment used.

Definitive diagnosis at discharge	Treatment						Total
	HD	CL	F	P	VS	V	
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	
Vasovagal syncope	18 (54,5)	1 (3,0)	1 (3,0)	1 (3,0)	1 (3,0)	0 (0)	22 (66,7)
Vasovagal presyncope	9 (27,3)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3,0)	10 (30,3)
Orthostatic hypotension	1 (3,0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3,0)
Arterial hypotension	3 (9,1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	3 (9,1)
Sinus bradycardia	1 (3,0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3,0)
Supraventricular rhythm disorder	1 (3,0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3,0)
Non-cardiogenic precordial pain	1 (3,0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3,0)
Mild anterior mitral valve prolapse	2 (6,1)	0 (0)	0 (0)	1 (3,0)	0 (0)	1 (3,0)	4 (12,1)
Cardiogenic syncope	1 (3,0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (3,0)

Notes: HD (Hygienic-dietary); LC (Lithium carbonate); P (Phenobarbital); PR (Propranolol); SV (Sodium valproate); V (Verapamil)

DISCUSSION

In the study, the female sex was the most affected by the disease. Hu et al.,⁽¹²⁾ in their research, showed that the incidence in adolescent women was higher than in men (31,72 % vs. 26,25 %, $P < 0,05$). Similarly, Barón Esquivias et al.,⁽²⁾ reported that of a total of 589 inhabitants diagnosed with syncope, 53,1 % were female. These results coincided with those of the present study.

However, in the study by Silva Diazgranados et al.,⁽¹³⁾ they reported that the male sex was the most affected by syncope, occurring in 315 cases (53,5 %). This result is opposite to those of the current research.

Regarding age, adolescent patients predominated. A similar result was shown by the study by Hu et al.,⁽¹²⁾ who reported that adolescent patients (603; 28,9 %) had greater involvement with the disease compared with school age (136; 8,32 %) and preschool age (17; 2,71 %).

The authors consider that the discrepancies between age and sex in syncope are related to hormone levels and the development of the sympathetic nervous system (SNS). Women have a higher risk compared with men. This could be related to the presence of sex differences in muscle mass and venous distensibility in children. Also, low blood pressure or hypotension is more common in females, which leads to a reduction of blood in the brain, causing fainting. Similarly, the menstrual period in girls, who lose a high volume of blood during the day, produces a drop in blood pressure.

Among the symptoms, fainting and loss of consciousness were the most frequent. Hu et al.,⁽¹²⁾ in their research, reported that dizziness [men (224; 60,05 %) and women (261; 68,15 %)] and blurred vision [males (107; 26,69 %) and females (134; 34,99 %)] appeared more frequently in presyncope symptoms. These results were opposite to those obtained in the current study.

Mulet Gámez et al.,⁽⁴⁾ considered syncope as a syndrome characterized by five key aspects: critical reduction of global cerebral blood flow; rapid onset and often preceded by prodromes; total loss of consciousness (a feature that distinguishes it from presyncope); loss of voluntary muscle tone with falling; and rapid, spontaneous, and complete recovery. These criteria are related to what was found by the authors of the present research, where most patients presented fainting and loss of consciousness; fundamental symptoms for the diagnosis of syncope.

Regarding electrocardiographic abnormalities, in most cases the electrocardiogram (ECG) was normal. A similar result was shown by the study by Gonzalez Garcia et al.,⁽¹⁴⁾ who reported that, of a total of 440 patients diagnosed with syncope, an ECG was performed in 197 (44,7 %) and no significant abnormality was observed.

In the research by Silva Diazgranados et al.,⁽¹³⁾ of a total of 586 patients diagnosed with syncope, an ECG was indicated in 446 cases (79,12 %) and no electrocardiographic abnormalities were found. This result demonstrated that it is necessary to indicate an ECG in all patients with this condition to rule out other cardiac diseases where electrocardiographic abnormalities are indeed expected to be found.

Mulet Gámez et al.,⁽⁴⁾ stated that the electrocardiogram is the first complementary test to be indicated in the evaluation of syncope given its accessibility, cost, safety, and reproducibility. Its value not only pertains to the fortuitous diagnosis of major rhythm and conduction disorders directly responsible for syncope in the emergency context.

In the research, most patients had vasovagal syncope (VVS) as the definitive diagnosis at discharge. According to the authors, this is the most frequent in the pediatric population and originates from abrupt hypotension accompanied or not by bradycardia. Its triggering factors are orthostatic and emotional stress.

In the study by Barón Esquivias et al.,⁽²⁾ of a total of 589 patients, 405 (68,8 %) were diagnosed with VVS. This result agreed with the current research. Neurally mediated syncope represents 70-80 % of pediatric syncope cases, and one of the most common forms is vasovagal syncope.⁽⁵⁾

The most used treatment in patients with syncope was hygienic-dietary. The best therapy against VVS is aimed at controlling triggering risk factors, as well as education about the disease. Triggering factors of the disease such as bradycardia, hypotension, sudden postural change with the head raised, prolonged standing, and painful stimuli are of utmost importance for the knowledge of the child and parents in order to avoid the onset of syncope. Likewise, the practice of autonomous exercises should be recommended, such as tilt training and isometric arm counterpressure maneuvers.⁽⁵⁾

Pharmacological management in these patients is not effective, and trials have been conducted with beta-blockers, alpha agonists, and corticosteroids such as fludrocortisone without finding conclusive results in favor of their use.⁽⁹⁾

CONCLUSIONS

Syncope is an important and common clinical problem in the pediatric population; most cases correspond to benign vasovagal etiologies that do not represent a threat to the patient's life. It is more frequent in the female sex and in ages between 10 and 14 years. The electrocardiogram is fundamental in the evaluation of patients who present with syncope, since the findings may suggest an underlying cardiac cause. Treatment seeks to stratify patient risk and the underlying pathophysiological mechanisms in order to address the underlying disease causing the syncope.

BIBLIOGRAPHIC REFERENCES

1. Wang J, Li H, Huang X, Hu H, Lian B, Zhang D, et al. Adult vasovagal syncope with abdominal pain diagnosed by head-up tilt combined with transcranial doppler: a preliminary study. BMC neurology [Internet]. 2024 [citado 20/05/2026]; 24(1): 118. Disponible en: <https://doi.org/10.1186/s12883-024-03623-1>
2. Barón Esquiviasa G, Quintanilla M, Díaz Martín AJ, Barón Solís C, Almeida González CV, García Romero, et al. Recurrencia y mortalidad a largo plazo de los pacientes con síncope no cardiogénico. Rev Esp Cardiol [Internet]. 2022 [citado 20/05/2026]; 75(7): 568–575. Disponible en: <https://doi.org/10.1016/j.recesp.2021.10.003>
3. Ali M, Pachon Maetos JC, Kichloo A, Masudi S, Grubb BP, Kanjwal K. Management strategies for vasovagal syncope. Pacing and clinical electrophysiology. PACE [Internet]. 2021 [citado 20/05/2026]; 44(12): 2100–2108. Disponible en: <https://doi.org/10.1111/pace.14402>
4. Mulet Gámez AM, Mulet Pérez A, Perdomo González G. Síncope: ¿síntoma o síndrome? Una aproximación semiológica contemporánea. CCM [Internet]. 2024 [citado 27/12/2024]; 28: e5041. Disponible en: <https://revcocmed.sld.cu/index.php/cocmed/article/view/5041>
5. Xu WR, Du JB, Jin HF. Can pediatric vasovagal syncope be individually managed?. World journal of pediatrics. WJP [Internet]. 2022 [citado 27/12/2024]; 18(1): 4–6. Disponible en: <https://doi.org/10.1007/s12519-021-00495-0>

6. Militello C, Vecchio N, Albina G, Barroso F, Di Toro D, et al. Consenso Argentino para el Diagnóstico y Tratamiento del Síncope. Sociedad Argentina de Cardiología. Rev Argent Cardiol [Internet]. 2021 [citado 27/12/2024]; 89(Supl3): 1-60. Disponible en: <https://www.sac.org.ar/wp-content/uploads/2021/06/consenso-89-3.pdf>
7. Corvino AR, Russo V, Monaco MGL, Garzillo EM, Guida D, Comune A, et al. Vasovagal Syncope at Work: A Narrative Review for an Occupational Management Proposal. International journal of environmental research and public health [Internet]. 2023 [citado 27/12/2024]; 20(8): 5460. Disponible en: <https://doi.org/10.3390/ijerph20085460>
8. Molina Castaño D, Campos Quesada M, Núñez Guerrero A. Síncope: generalidades. Revista Médica Sinergia [Internet]. 2020 [citado 27/12/2024]; 5(5). Disponible en: <https://doi.org/10.31434/rms.v5i5.478>
9. Castañeda González JP, Diaztagle Fernández JJ, Mendoza Orozco JE. Síncope: enfoque diagnóstico para el médico en atención primaria. Rev. salud. Bosque [Internet]. 2023 [citado 27/12/2024]; 13(2): 1-18. Disponible en: <https://doi.org/10.18270/rsb.v13i1.4432>
10. Fernández Álvarez R, González García J. Diagnóstico y tratamiento del síncope. Protoc diagn ter pediatr. [Internet]. 2020 [citado 08/02/2025]; (1):177-182. Disponible en: https://www.aeped.es/sites/default/files/documentos/14_sincope.pdf
11. Quesada Barroso A, Rodríguez Ramón FJ, Sánchez Vicente L, Delgado Cabrera N, Falcón González LH. Síncope en pediatría y síndrome de QT largo congénito. Rev canarias pediátrica [Internet]. 2024 [citado 08/02/2025]; 47(1). Disponible en: <https://scptfe.com/wp-content/uploads/2024/05/sincope.pdf>
12. Hu E, Liu X, Chen Q, Wang C. Investigation on the Incidence of Syncope in Children and Adolescents Aged 2-18 Years in Changsha. Frontiers in pediatrics [Internet]. 2021 [citado 08/02/2025]; 9: 638394. Disponible en: <https://doi.org/10.3389/fped.2021.638394>
13. Silva Diazgranados LE, Danilo Benito M, Camacho Ramos CA, Gilón Córdoba LF, Catalina Arcos L, Méndez Toro A, et al. Caracterización clínica de los pacientes con síncope. Rev Colomb Cardiol [Internet]. 2017 [citado 08/02/2025]; 24(5): 429-435. Disponible en: <http://dx.doi.org/10.1016/j.rccar.2017.05.017>
14. Gonzalez Garcia J, Fernandez Alvarez R, Angelats CM, Ballester Y, Martinez J, Mintegi S. Pilot Trial of the Performance of Electrocardiogram in the Evaluation of Childhood Syncope in the Emergency Department. Pediatric emergency care [Internet]. 2021 [citado 08/02/2025]; 37(12): e1008–e1011. Disponible en: <https://doi.org/10.1097/PEC.0000000000001864>