

Evaluating the patient with loss of consciousness

Tahsin Khan, Mark Stecker¹, Mona Stecker¹

SUNY Stony Brook School of Medicine, Stony Brook, NY 11794, ¹Winthrop University Hospital, Mineola, NY 11501, USA

E-mail: Tahsin Khan - tkhan1031@gmail.com; *Mark Stecker - mstecker@winthrop.org; Mona Stecker - MKStecker@Winthrop.org

*Corresponding author

Received: 11 February 15 Accepted: 18 February 15 Published: 25 May 15

This article may be cited as:

Khan T, Stecker M, Stecker M. Evaluating the patient with loss of consciousness. *Surg Neurol Int* 2015;6:S262-5.

Available FREE in open access from: <http://www.surgicalneurologyint.com/text.asp?2015/6/7/262/157615>

Copyright: © 2015 Khan T. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

INTRODUCTION

Patients who have had an episode of altered awareness and are subsequently brought to the hospital for evaluation are common^[9] amounting to more than 6% of all emergency room (ER) admissions. One of the key elements in properly evaluating these patients is to perform a good history. The history can come from a number of different sources including the patient, family, and/or others present at the time of the event. In each case, the information provided may be biased by the preconceptions of the person providing the history. Thus, it is critical to understand which aspects of the history are most important and most reliable in distinguishing between the possible diagnoses. For example, it is not uncommon for an observer to state that a patient was unconscious if he/she did not respond to voice. Only further questioning about other characteristics of the patient at that time such as loss of tone or abnormal movements may help sort out the actual events.

It is also common for providers to lump all patients with transient alterations of awareness under the diagnosis of syncope. It is thus essential to clearly define the term syncope. The Merriam-Webster Dictionary defines syncope as “loss of consciousness (LOC) resulting from insufficient blood flow to the brain.”^[5] There are various conditions that can be mistaken for syncope and it is important that a correct diagnosis be made because management and care will differ depending on that diagnosis. In this paper we will primarily address the issue of distinguishing a neurological cause versus a cardiac cause for a transient alteration of awareness; but it is important as well to cover the factors that place a patient at high risk for a serious cardiac event.

The differential diagnoses

In order to obtain an optimal history, it is important to be aware of the diagnoses that could potentially cause the patient’s symptoms. Soteriades^[9] reviewed data from the Framingham study for all patients with a diagnosis of syncope and was able to determine the eventual cause for syncope. [Table 1] shows the incidence of various etiologies in patients with and without cardiac disease. It is clear that neurologic causes are not common compared with cardiac and vaso-vagal causes of syncope; but they nonetheless form an important subset of all patients with an initial diagnosis of syncope. [Table 2] provides a larger

Table 1: Causes of syncope from Soteriades^[9] in patients with and without cardiovascular disease

Cause	Cardiovascular disease absent (%)	Cardiovascular disease present (%)
Cardiac	4.8	22
Unknown	37.5	34
Stroke/TIA	2.1	9.5
Seizure	4.8	4.9
Vasovagal	24.3	12.6
Orthostatic	10.3	6.7
Medication	6.9	6.7
Other	9.2	3.6

TIA: Transient ischemic attack

Access this article online

Quick Response Code:



Website:

www.surgicalneurologyint.com

DOI:

10.4103/2152-7806.157615

Table 2: Conditions that could present with loss of consciousness concentrating on neurological causes

Category	Condition	Comment
Cardiac	Vaso-vagal syncope	Cerebral hypoperfusion, brief LOC
	Arrythmia	Cerebral hypoperfusion may have prolonged LOC if the period of hypoperfusion is prolonged
	Ischemic or severe valvular disease	
Neurologic	TIA	Unless there is brainstem involvement, TIA does not cause LOC. Patient will have focal neurological signs not seen with true syncope
	Stroke	If there is LOC with a stroke there is either bilaterally ischemia or brainstem ischemia
	Seizure	Can have post-ictal confusion, unlike true syncope
	Delirium	Although symptoms fluctuate over time, there is no sudden onset or sudden return to normal
	Dementia	Careful history will show a long-term deterioration as opposed to a sudden syncopal event
	Narcolepsy	Patient reports falling asleep throughout day, paralysis 1-2 min after awakening, daytime sleepiness, and cataplexy (all motor function is lost but patient is aware)
Orthostatic		Occurs with autonomic failure or fluid depletion. Mainly LOC will be with standing. History of prior episodes of near syncope with standing
Psychogenic		Episodes may be very prolonged with rapid recovery. Inconsistent symptoms
Medication		Any medication that affects blood pressure or the autonomic nervous system may cause syncope
Metabolic		Hypoglycemia, severe dehydration

LOC: Loss of consciousness, TIA: Transient ischemic attack

list of some conditions that could be associated with an apparent LOC. It is important to realize that the initial determination of LOC is generally made by a lay person without a medical background; and so the differential diagnosis must be extended to include diagnoses that medical personnel would not always associate with unconsciousness.

[Table 3] shows some of the typical symptoms for “LOC.” Witnesses will likely describe an event in their own terms but will often not attend to the preceding or subsequent events that are critical to making the diagnosis. Therefore, follow up questions are very important to create a timeline describing the event in detail. [Table 4] shows some frequently obtained elements of the history in patients with syncope, stroke, transient ischemic attack (TIA), delirium, and seizures. Hoefnagels^[4] studied some of the factors in the history that helped determine whether a patient had syncope or seizure. These factors are abstracted in Table 5a and 5b; and show the importance of observing whether the patient had pallor/sweating before the event as a predictor for syncope. The observation that the patient was “blue” was strongly predictive of seizure as was disorientation and tongue biting.

Besides the questions shown in Tables 4 and 5, there are other important questions whose answers may be useful in making the diagnosis of vaso-vagal syncope versus other cardiac conditions. These have been addressed by prior studies that try to use elements of the history and physical examination to predict patients presenting with apparent syncope that are at high risk of serious adverse events. One such study led to the creation of the Calgary syncope symptom score.^[8] This

Table 3: Symptoms for loss of consciousness used by non-medical providers. All of these need to be interpreted

Term	Comment
Passed out	Nonspecific. It is important to create a timeline of events before and after the “passing out”
Seized	Need to determine informants description-were there motor movements and what kind. Convulsive syncope is generally short
Stared	Suggests seizures, TIA or delirium
Slumped over	Suggests generalized weakness-possibly due to hypoperfusion
Collapsed	Often used to describe true syncope
Sleepy	More suggestive of delirium

TIA: Transient ischemic attack

scale involves asking the seven questions detailed in Table 6 and has been demonstrated to have an overall sensitivity of 87% and specificity of 32% in making the diagnosis of vasovagal syncope. Another set of questions comes from the analyses that led to the Boston syncope rule.^[2,3] These investigators asked questions in eight categories and considered the patient at high risk for an adverse outcome (and hence unlikely to be vaso-vagal syncope) if the patient had symptoms or signs in any of the following categories: (i) Signs or symptoms of acute coronary syndrome, (ii) signs of cardiac conduction diseases, (iii) worrisome cardiac history, (iv) valvular heart disease by history or examination, (v) family history of sudden death, (vi) persistent abnormal vital signs, (vii) volume depletion, or (viii) primary central nervous system (CNS) event. This rule was 97% sensitive and 62% specific in finding patients with an adverse outcome of an apparent syncopal event. The San Francisco syncope rule^[6,7] uses the

Table 4: Historical elements in patients describing the time around the event of altered consciousness and their prevalence in various diseases

Historical element	Result	Diagnosis				
		Syncope	Delirium	TIA	Stroke	Seizure
Duration	Seconds	Yes	No	Possibly	No	Yes
	Minutes	No	Unlikely	Yes	No	Yes
	Hours	No	Yes	Possibly	No	Possibly
	Days	No	Yes	No	Yes	Rare
Consciousness	Complete loss	Yes	No	No	Rare	Possibly
Twitching	Minor	Sometimes	Yes	No	No	Yes
	Generalized shaking	Sometimes	Rare	No	No	Yes
Staring		No	No	No	Rare	Yes
Prodromal symptoms	None	Yes	No	Yes	Yes	Yes
	Pallor	Yes	No	No	No	Possibly
	Graying of vision					
	Smell	No	No	No	No	Yes
	Taste					
	Epigastric distress					
Prodromal history	Déjà vu					
	Dehydration	Yes	Yes	No	No	Possibly
	Poor nutrition					
Postevent symptoms	Viral illness					
	None	Yes	No	Yes	No	Generally brief
	Focal neurological Examination	No	Possibly mild	No	Yes	Possibly
Posture	Confusion	Rare	Yes	No	Possibly	Possibly
	Standing	Yes	Yes	Yes	Yes	Yes
	Lying	Rare	Yes	Yes	Yes	Yes
State	Awake	Yes	Yes	Yes	Yes	Yes
	Asleep	No	No	No	Yes	Yes
Other Symptoms	Tongue biting	No	No	No	No	Sometimes
	Incontinence	Rare	Rare	No	Possibly	Yes
Cardiac symptoms	Angina	Yes	No	No	Occasionally	No
	Palpitations					

TIA: Transient ischemic attack

Table 5a: Individual symptoms and the risk of seizure versus nonseizure according to Hoefnagels^[4]

Symptoms	Likelihood ratio for seizures
Blue face	16.9
Tongue biting	7.3
Observed disorientation	5.0
Frothing at the mouth	4.7
Aching muscles	2.6
Sleepy	2.0
Pale face	0.5

Table 5b: The probability of seizure as a function of various combinations of four symptoms according to Hoefnagels^[4]

Oriented	Sweating	Age	Tongue biting	Probability of seizure
No	No	<45	Yes	1.0
No	No	<45	No	0.96
No	No	>45	No	0.66
Yes	No	<45	No	0.15
Yes	No	>45	No	0.01
Yes	Yes	>45	No	0.00
Yes	Yes	<45	No	0.01

mnemonic CHES to identify patients at high risk for adverse outcomes. C stands for a history of congestive heart failure, H-Hematocrit <30%, E-abnormal ECG, S-shortness of breath, S-triage systolic blood

pressure <90 mmHg. Other scores such as the ROSE score and the OESIL score include bradycardia, chest pain, oxygen saturation <94%, age >65, and syncope without a prodrome as risk factors.^[1] Age is a very

Table 6: The calgary syncope score.^[8] The total score is the sum of the scores for all positive answers. Vasovagal syncope is diagnosed if the total point score is ≥ -2 . The annotation (none) regarding question 4 indicated that none of the patients remembered being unconscious

Question	Score	Odds ratio for syncope
Is there a history of bifasicular block. Asystole, supraventricular tachycardia, or diabetes	-5	0.02
At the time have bystanders noted you to be blue during your faint?	-4	0.15
Did your syncope start when you were 35 years of age or older	-3	0.04
Did you remember anything about being unconscious	-2	0.4 (none)
Do you have lightheaded spells or faint with prolonged sitting or standing?	1	3.77
Do you sweat or feel warm before a faint	2	5.23
Do you have lightheaded spells or faint with pain in medical settings	3	15.38

important predictor as the incidence of syncope is at least 4 times higher in those older than 80 as opposed to those aged less than 50 years.^[9]

Physical examination

The physical examination can reveal more about the reasons for a patient's LOC. Overall, the examination is targeted toward finding signs of cardiac disease and any evidence of neurologic illness. Useful physical findings in patients presenting with loss of consciousness. [Table 7] lists the various findings on examination and their interpretation.^[8]

Summary

Although there has been much literature dedicated to making the correct diagnosis in a patient who presents with a transiently altered level of consciousness, the concept remains difficult and is strongly dependent upon the provider's skill in obtaining a complete history and physical examination.

Table 7: Useful physical findings in patients presenting with loss of consciousness

Finding	Possible implication
Heart rate-tachycardic or bradycardic	Arrhythmia, acute illness, GI bleed
Respiration rate-slow or fast	Hyper/hypoventilation, pneumothorax, heart failure
Carotid massage-positive	Carotid hypersensitivity
Blood pressure changes	Orthostatic hypotension, drug-induced hypotension, volume depletion
Neck vein distention	PE, CHF, cardiac pathology
Skin pallor	Blood loss, neurocardiogenic cause
Heart murmur	cardiac syncope
Left ventricular lift, S3 gallop	Heart failure with cardiac syncope
Rash	Anaphylaxis causing syncope
Abdominal tenderness	Blood loss, hypotensive cause of syncope
Absent/variable pulses	Dissecting aneurysm, subclavian steal
Neurologic findings	Seizure, stroke, TIA

TIA: Transient ischemic attack, GI: Gastrointestinal, PE: Pulmonary Embolus, CHF: Congestive Heart Failure

REFERENCES

1. Ebell MH. Risk stratification of patients presenting with syncope. *Am Fam Physician* 2012;85:1047-52.
2. Grossman SA, Bar J, Fischer C, Lipsitz LA, Mottley L, Sands K, et al. Reducing admissions utilizing the Boston Syncope Criteria. *J Emerg Med* 2012;42:345-52.
3. Grossman SA, Fischer C, Bar JL, Lipsitz LA, Mottley L, Sands K, et al. The yield of head CT in syncope: A pilot study. *Intern Emerg Med* 2007;2:46-9.
4. Hoefnagels WA, Padberg GW, Overweg J, van der Velde EA, Roos RA. Transient loss of consciousness: The value of the history for distinguishing seizure from syncope. *J Neurol* 1991;238:39-43.
5. Merriam-Webster I. Merriam-Webster's collegiate dictionary. Springfield, Mass., U.S.A.: Merriam-Webster; 1993.
6. Quinn J, McDermott D, Stiell I, Kohn M, Wells G. Prospective validation of the San Francisco Syncope Rule to predict patients with serious outcomes. *Ann Emerg Med* 2006;47:448-54.
7. Quinn JV, Stiell IG, McDermott DA, Kohn MA, Wells GA. The San Francisco Syncope Rule vs physician judgment and decision making. *Am J Emerg Med* 2005;23:782-6.
8. Romme JJ, van Dijk N, Boer KR, Bossuyt PM, Wieling W, Reitsma JB. Diagnosing vasovagal syncope based on quantitative history-taking: Validation of the Calgary Syncope Symptom Score. *Eur Heart J* 2009;30:2888-96.
9. Soteriades ES, Evans JC, Larson MG, Chen MH, Chen L, Benjamin EJ, et al. Incidence and prognosis of syncope. *N Engl J Med* 2002;347:878-85.