



Original article

## Transient loss of consciousness assessment in a University Hospital: From diagnosis to prognosis

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### ABSTRACT

**Background:** Transient loss of consciousness (TLoC) is a symptom that has several differential etiologic diagnosis, causes significant morbidity and mortality with impact on quality of life.

**Objective:** The purpose of this study was to access the diagnosis and prognosis of these patients admitted in a Portuguese University Hospital.

**Methods:** The study included 125 patients with TLoC admitted in the emergency room and then admitted to the hospital during the year 2013. Patients were contacted by phone for follow-up evaluations, during the 18 months from the date of admission.

**Results:** Cardiogenic syncope was the most common etiology of TLoC (39.2%). The 18-month overall mortality was 11.2%, however this was higher in patients with unexplained TLoC, with an 18-month mortality of 27.8% ( $p = 0.031$ ); It was found that half of patients who died, did so in the first month from admission date; 20% of patients had recurrent episodes of TLoC (mean number of 5.6 episodes), with a higher percentage of recurrence occurring in patients with reflex syncope (35.3%;  $p = 0.023$ ). 60% of patients with recurrent episodes suffered accidents and/or injuries, and 20% of recurrence patients gave up driving ( $p = 0.019$ ).

**Conclusion:** The results obtained highlight the burden of TLoC in terms of morbidity and mortality, similar results to those previously published, except for the prevalence of the etiology, cause of death and recurrence's etiology of TLoC. This study emphasizes the significant implications that TLoC leads on morbidity and mortality being essential its accurate diagnosis.

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### Introduction

Transient loss of consciousness (TLoC) is a frequent manifestation in the general population. An estimated 6.2/1000 person-years have syncope,<sup>1</sup> constituting a significant reason for admission in the Emergency Department (ED) and subsequent hospitalization. TLoC cases correspond to 0.6–1.2% of visits to the ED<sup>2–4</sup> and 6% of hospital admissions.<sup>5</sup>

TLoC can occur in benign situations, such as reflex syncope<sup>1,6</sup>; it may be a manifestation of a disease with origin in the central nervous system (CNS), such as epilepsy or cerebrovascular disease<sup>6–9</sup>;

or may be a symptom of cardiac disease, associated with a high mortality risk and increased incidence of sudden death.<sup>1,6,10–12</sup>

Recurrent episodes of TLoC carries significant morbidity,<sup>6,11–13</sup> increased need of medical care<sup>2,14–16</sup> and determine significant changes in quality of life.<sup>17,18</sup>

Because it is a public health problem with high frequency and variable risk of mortality and morbidity, it is important to establish the correct diagnosis and prognosis of patients with TLoC.

Little is known about the diagnosis and specially the prognosis of Portuguese patients with TLoC. Therefore, this study aimed to evaluate the diagnosis and prognosis over 18 months in patients with different causes of TLoC, assessing mortality, recurrence episodes of TLoC, injuries and traffic accidents associated with recurrent episodes, limitation of driving and the impact on quality of life.

### Methods

TLoC is defined as a rapid onset, short duration loss of consciousness that occurs transiently and with spontaneous recovery.

*Abbreviations:* AV, atrioventricular; CET, cranioencephalic trauma; CNS, central nervous system; CT, computerized tomography; ECG, electrocardiogram; ER, emergency room; SH, subdural hemorrhage; TLoC, transient loss of consciousness.

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**Table 1**  
Diagnostic tests performed for the TLoC index episode (total and by TLoC etiology).

Type of diagnostic test	Total n = 125 N (%)	TLoC etiology					Unexplained TLoC n = 18 N (%)
		Reflex syncope n = 34 N (%)	Cardiogenic syncope n = 49 N (%)	Syncope due to orthostatic hypotension n = 7 N (%)	CNS TLoC n = 16 N (%)	Psychogenic psudosyncope n = 1 N (%)	
Laboratory test	124 (99.2%)	34 (100%)	48 (98.0%)	7 (100%)	16 (100%)	1 (100%)	18 (100%)
ECG	120 (96.0%)	32 (94.1%)	49 (100%)	6 (85.7%)	14 (87.5%)	1 (100%)	18 (100%)
Echocardiography	90 (72.0%)	25 (73.5%)	38 (77.6%)	3 (42.9%)	7 (43.8%)	1 (100%)	16 (88.9%)
Chest X-ray	74 (59.2%)	19 (55.9%)	27 (55.1%)	6 (85.7%)	14 (87.5%)	0 (0%)	8 (44.4%)
Brain CT scan	66 (52.8%)	17 (50%)	19 (38.8%)	5 (71.4%)	15 (93.8%)	0 (0%)	10 (55.6%)
Telemetry	50 (40.0%)	11 (32.4%)	33 (67.3%)	0 (0%)	2 (12.5%)	0 (0%)	4 (22.2%)
EEG	31 (24.8%)	12 (35.3%)	3 (6.1%)	1 (14.3%)	7 (43.8%)	0 (0%)	8 (44.4%)
Holter	29 (23.2%)	13 (38.2%)	7 (14.3%)	1 (14.3%)	0 (0%)	0 (0%)	8 (44.4%)
Carotid Doppler	25 (20.0%)	9 (26.5%)	5 (10.2%)	1 (14.3%)	7 (43.8%)	0 (0%)	3 (16.7%)
Chest Angio CT/CT scan	21 (16.8%)	5 (14.7%)	6 (12.2%)	3 (42.9%)	3 (18.9%)	0 (0%)	4 (22.2%)
Tilt test	20 (16.0%)	17 (50%)	1 (2.0%)	0 (0%)	0 (0%)	0 (0%)	2 (11.1%)
Coronary Angiography	15 (12.0%)	0 (0%)	13 (26.5%)	0 (0%)	0 (0%)	0 (0%)	2 (11.1%)
Carotid sinus massage	13 (10.4%)	13 (38.2%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
EFS	10 (8.0%)	4 (11.8%)	3 (6.1%)	0 (0%)	0 (0%)	0 (0%)	3 (16.7%)
Exercise test	4 (3.2%)	2 (5.9%)	1 (2.0%)	0 (0%)	0 (0%)	0 (0%)	1 (5.6%)
Brain MRI	3 (2.4%)	2 (5.9%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (5.6%)

CNS, central nervous system; CT, computed tomography; ECG, Electrocardiogram; EEG, Electroencephalogram; EFS, Electrophysiological study; MRI, Magnetic resonance; TLoC, Transient loss of consciousness.

TLoC may occur due to several traumatic and non-traumatic causes, including: syncope, epilepsy and psychogenic pseudosyncope, among others.<sup>7</sup>

Syncope is defined as a sudden loss of consciousness due to transient global cerebral hypoperfusion characterized by rapid onset, short duration and spontaneous complete recovery.<sup>7,19</sup> Syncope is associated to an inability to maintain postural tone. Therefore, it is not compatible with seizures, vertigo, dizziness, coma, shock or other states of altered consciousness.<sup>10</sup>

We selected all patients with 18 years or more of age who were admitted consecutively in the ED of a university hospital during the year 2013 with TLoC and who were admitted in this hospital. This was considered the TLoC index episode. We reviewed the clinical data from the ED and inpatient and outpatient records of all patients selected for this study. The determination of TLoC etiology was based on the attributable cause considered by the physicians that observed the patient in the ED, during hospitalization and in the outpatient visits, after evaluation of diagnostic tests. 156 patients were included in this study, with the causes of TLoC classified in 6 groups: reflex syncope (includes neurocardiogenic and situational syncope and carotid sinus hypersensitivity), cardiogenic syncope (structural or arrhythmic), syncope due to orthostatic hypotension, TLoC with CNS origin (including epilepsy and cerebrovascular diseases), psychogenic pseudosyncope and unexplained TLoC.

Patient follow-up was obtained through clinical records and telephone contact with patients or relatives/caregivers. This information was gathered between July and August of 2015. We collected information regarding mortality, recurrent episodes of TLoC, consequences of new episodes, medical care and new hospitalization for TLoC. Mortality data was obtained by hospital process of the patient and by the information given by relatives/caregivers. Death certificates and autopsy reports were not evaluated. Furthermore we collected information about limitation on driving and the impact of TLoC in quality of life. Quality of life assessment was made through telephone contact asking the patient to define his quality of life in better, equal or worse in relation to the impact of TLoC in their lives. Follow-up corresponds to the period between the date of hospital admission for the TLoC index episode in 2013 to 18 months after, for each patient. Relatives or caregivers of patients who died during hospitalization from the index episode were not contacted with the information being obtained from clinical records.

We excluded patients who refused to participate, patients unable of giving the pretended information and patients, relatives/caregivers that could not be contacted by telephone.

This research was conducted in a university hospital and approved by the Ethics Committee for Health of the Hospital. All patients contacted by telephone were asked for their consent.

Data was analyzed using IBM SPSS 22.0. The qualitative variables are presented through frequency tables and the quantitative variables are presented by the mean, standard deviation, minimum and maximum values. Chi-square test and *t*-Student test were used for statistical analysis. Values were considered statistically significant at a 95% confidence interval (*p*-value: *p* < 0.05).

## Results

This study selection included 156 patients. However, we were unable to contact 31 of these patients (19.9%): 24 because it was not possible to contact them by telephone (77.4%) and 7 for refusal (22.6%). Of patients excluded, 14 were women (45.2%), 17 men (54.8%) with a mean age of 72 years ( $\pm 14$ ).

For analysis and in total were included in the study 125 patients (80.1%), whose follow-up was assessed from admission date up to 18 months after. Fifty-one patients were women (40.8%), 74 men (59.2%), the mean age was 70 years ( $\pm 15$ ) and ranged from 18 years up to 96 years.

Regarding the service where they remained hospitalized during the TLoC index episode, 65 patients were admitted in internal medicine (52.0%), 43 in cardiology (34.4%), 8 in neurology (6.4%), 5 in surgery (4%) and the remaining 4 patients in intensive/neurocritical care (3.2%). The average stay for the TLoC index episode was 11 days ( $\pm 11.1$ ), a median of 7 days, with the range varying between 1 day and a maximum of 74 days.

Regarding diagnostic tests performed, due to the TLoC index episode (Table 1), 99.2% of patients underwent Laboratory test (hemogram, kidney and renal function, electrolytes, C-reactive protein and myocardial necrosis markers, in some) an initial Electrocardiogram (ECG) was performed in 96% of patients (in those 9.2% had third-degree atrioventricular (AV) block and 2.5% had Mobitz II AV block, echocardiography in 72% (43.3% with changes), Chest X-ray in 59.2%, brain computerized tomography (CT) scan in 52.8% (30.3% with changes), Telemetry in 40% (44% with changes),

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