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Research Article

DIAGNOSTIC APPROACH AND EVALUATION OF SYNCOPE ETIOLOGY IN PATIENTS PRESENTING TO EMERGENCY DEPARTMENT WITH SYNCOPE

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ABSTRACT

Syncope is a rapidly developing and automatically recovering loss of consciousness and tonus, frequently seen in emergency services. We aimed that to evaluete syncope patients presenting to the emergency department and to create recommendations for rapid diagnozis and treatment at clinical approaches according to the results. The study evaluates a total of 310 patients administered to Şişli Hamidiye Etfal Hospital's Emergency Medical Clinic between 01/02/2014 and 31/07/2014 due to syncope. The information was recorded in study forms. Average, standard deviation, median, lowest, highest, ratio and frequency values were used in the descriptive statistics of the data. Distribution of variables was checked with Kolmogorov-Smirnov Test. Mann-Whitney U Test was used for the analysis of quantitative data. Chi-Squared Test was used for the analysis of qualitative data. SPSS 22.0 program was used in the Analyses. The syncope etiology was neurocardiogenic in 80 (25.8 %) patients, orthostatic in 46 (14.8 %), cardiogenic in 31 (10 %), neurogenic in 25 (8.1 %), metabolic in 24 (7.7 %) and hypovolemic in 15 (4.9 %). The remaining 89 (28.7 %) patients had syncope of unknown origin. A risk stratification based on SFSR showed that 228 (73.5 %) patients were in the non-risk group while 82 (26.5 %) were in the at-risk group. We believe that the low administration rate of patients, who were administered to our emergency service with high risks according to syncope risk scores, can increase by using risk-scoring systems, and that unnecessary administrations of low-risk patients can be prevented.

Keywords: Diagnozis, Syncope, Emergency Medicine

INTRODUCTION

Syncope is defined as transient loss of consciousness (T-LOC) encompassing all disorders characterized by self-limitng loss of consicousness (LOC) irrespective of mechanism[1,2]. Syncope is not a disease per se, but rather it is a symptom that may appear during the course or at the last stage of many diseases or various disorders. The self-limiting character of syncope and full recovery following it suggest that syncope-related morbidity and mortality is not secondary to syncope itself, but rather resultant trauma and the severity of underlying disease. Thus, syncope has a clinical significance as a warning sign or a cause of injury rather than a disease[3]. Syncope-associated admissions constitute 1-5 % of annual emergency department admissions and 6 % of hospital admissions[4,5]. It has been estimated that one in every four persons experience a syncopal attack during lifetime. Frequency and morbidity of syncope increases with age[6,7]. San Fransisco Syncope Rule (SFSR) transformed endpoints such as death, acute myocardial infarction, arrhythmia, pulmonary embolism, stroke, subarachnoid bleeding, and severe bleeding into 5-variable decisive analysis[7]. SFSR has made substantial contribution to risk assessment of syncope. Acute symptoms and vital signs are the major determinants of the need of urgent stabilization. As syncope is a transient event by definition, most patients are asymptomatic at the time of admission and many of them require no emergent intervention. However, asymptomatic patients of advanced age or with known cardiovascular disease should have the priority for admission to syncope evaluation unit[8]. This study aimed to investigate patients with syncope presenting to emergency department.

MATERIALS AND METHOD

Our study included a total of 310 patients patients over 18 years of age who were admitted to Şişli Hamidiye Etfal Training and Research Hospital, Emergency Clinic between 01 February 2014 and 31 July 2014 with the complaint of "fainting" and who were subsequently diagnosed with syncope. Age, sex, type of emergency department admission, time of emergency admission, vital signs (body temperature, blood pressure, pulse rate, fingertip blood glucose (FBG), oxygen saturation (SpO_2), findings on ECG and arterial blood gas analysis, Glascow Coma Scale (GCS) score, findings of rectal examination, comorbidities, previous history of syncope, medications used, laboratory results, advanced radiological examinations, syncope etiology, duration and outcome of emergency department stay, trauma exposure and consultation notes of other departments were recorded on previously prepared study forms. The enrolled patients were assessed by dividing them into at-risk and non-risk groups according to SFSR. The patients were categorized into 7 groups based on the final diagnoses they had in the emergency department. The clinical and demographic data of the groups were compared with the SPSS for Windows 13.00 software package. The descrpitive statistics included patient number (n), percentage (%), and mean ± SD. The groups were compared with each other using Chi-Square and student's t test. A p value of less than 0.05 was considered statistically significant.

Table 1: Clinical data of the patients

Variable	Median (Min-Max)
Sistolic Blood pressure (mmHg)	119 (60-230)
Temparature of body (^{0}C)	36 (34-39)
Pulse (bpm/minute)	82 (50-180)
Glucose (mg/dl)	105 (17-860)
SPO_2 (%)	97 (78-100)
Glasgow Coma Score	15 (7-15)
Leucosyte (bin/µl)	8 (3-32)
Heamoglobin (g/l)	13 (5-18)
Hematocrit (%)	39 (18-55)
Trombosit (bin/µl)	247 (3-665)
Ürea (mg/dl)	31 (15-300)
Creatinin (mg/dl)	0.8 (0.2-608)
Sodium (mEq/dl)	140 (124-146)
Potasyum (mEq/dl)	4.1 (3-6.5)
Troponin (ng/dl)	0.1 (0-2.9)
CK-MB (mg/dl)	2 (0-19)
pH	7.0 (7.0-7.6)
pO_2	65 (16-130)
pCO_2	43 (19-65)

Table 2: Analysis of patients presenting to emergency department with syncope in terms of past history, syncope etiology, time of admission, and type of admission

		n	%
Past history	Myocardial infarction	18	5.8
	Diabetes mellitus	44	14.2
	Gastrointestinal bleeding	3	1
	Congestive heart failure	8	2.6
	Epilepsy	10	3.2
	Cerebrovasculer disease	3	1
	Hypertension	33	10.6
	Other	33	10.6
	N/A	169	54.5
Syncope etiology	Cardiogenic	31	10
	Metabolic	24	7.7
	Ortosthatic hyppotension	46	14.8
	Neurogenic	25	8.1
	Hypovolemic	15	4.8
	Neurocardiogenic	80	25.8
	idiopathic	89	28.7
Time of emergency department admission	08.00-15.59	165	53.2
	16.00-23.59	102	32.9
	24.00-07.59	43	13.9

Table 3: The duration of emergency department follow-up of patient

	hour	n	%
The duration of emergency department follow-up	0-6 hour	18	5.8
	6-12	44	14.2
	12-18 bleeding	3	1
	18-24	8	2.6
	24+	10	3.2

RESULTS

Among patients presenting to our emergency department with syncope between 01.02.2014 - 31.07.2014, 310 subjects were included by our study. The mean age of the study population was 46.2 ± 21.4 years and 155 were men and 155 were women (each sex 50 %). The clinical and demographic data of the patients were summarized on Table 1. One hundred ans sixty-five (53.2 %) patients were admitted to emergency department between 08:00 and 16:00. One hundred and seventy-seven (57.1 %) patients were brought to emergency department by teams of 112 emergency ambulance service. Forty-four (14.2 %) patients had diabetes mellitus, 33 (10.6 %) had hypertension, 18 (5.8 %) had previous myocardial infarction, 8 (2.6 %) congestive heart failure, and 10 (3.2 %) had epilepsy. One hundred and sixty-nine (54.5 %) patients had no notable medical history. The syncope etiology was neurocardiogenic in 80 (25.8 %) patients, orthostatic in 46 (14.8 %), cardiogenic in 31 (10 %), neurogenic in 25 (8.1 %), metabolic in 24 (7.7 %) and hypovolemic in 15 (4.9 %). The remaining 89 (28.7 %) patients had syncope of unknown origin (Table 2). A risk stratification based on SFSR showed that 228 (73.5 %) patients were in the non-risk group while 82 (26.5 %) were in the at-risk group. The duration of emergency department follow-up was 0 to 6 hours in 217 (70 %) patients and there were only 2 patients followed for 24 hours or longer (Table 3). Two hundred and sixty-eight (86.5 %) were discharged from the emergency department, 40 (12.9 %) were admitted to a clinic and two (0.6 %) died.

DISCUSSION

Ozkan *et al* reported that 48 % of their patients were female and 52 % were male and they did not reported any significant difference between the two sexes[2]. Previous studies similarly detected no significant differences between both sexes[9,10]. In our study 155 (50 %) subjects were male and 155 (50 %) were female ($p > 0.05$). We also found no significant difference between both sexes with respec to syncope etiology. Despite affecting all age groups, syncope has an increased incidence and morbidity in the elderly population[11,12]. The mean ages of the syncope victims reported by different studies have been similar. Ammirati *et al* reported a mean age of 62.5 ± 22.3 in patients presenting with syncope[13]. Sheldon *et al* reported a mean age of 53 ± 20 years in a study examining patients who presented to emergency department with syncope and seizure[14]. Colman *et al* showed that only 5 % of adults experience their first syncopal attack after the age of 40[15]. The incidence of syncope in the Framingham study sharply increased after the age of 70 years, with an annual syncope incidence rising from 5.7 % to 11.1 %[15]. We found that our patients were between 18 and 94 years of age, with a mean age of 46.2 years. A study by Colman *et al* reported that only 5 % of adults experienced their first syncopal attack after the age of 40[15]. We found out that 226 (72.9 %) of our patients had no previous syncopal episode. Of the patients with the first syncopal attack, 47.3 % were between the ages of 18 and 39. These findings were in accordance with the literature data. The majority of syncope cases cannot be diagnosed with a specific disorder in the emergency department despite a detailed evaluation[15,16]. Performance of advanced tests is appropriate in patients when no specific syncope etiology could be revealed by patient history, physical examination and ECG. Recent studies have reported that a detailed history taking and meticulous physical examination may be sufficient for determining a specific syncope etiology in 49-85 % of patients[17]. Sheldon *et al* reported that 86 % of cases could not be diagnosed[14]. This diagnostic difficulty may stem from the transient nature of the disorder, inability of the patient to give a detailed history, or failure to perform a complete patient evaluation. Thirteen of 121 patients admitted for syncope of unknown origin could be diagnosed a specific disorder and advanced cardiac assessment modalities such as ECG, holter monitoring, and electrophysiological study were useful for diagnosis[18,19]. Eighty-nine (28.7 %) of our patients could not be diagnosed with a specific etiology and were ultimately considered to have idiopathic syncope. Day *et al* reported that 40 % of their cases had vasovagal-psychogenic syncope, 32 % had loss of consciousness related to central nervous sytem pathology, 8 % had syncope of cardiac origin, and 7 % had loss of consciousness secondary to drugs or metabolic causes. Thirteen percent of cases remained undiagnosed[20]. The rates of different syncope etiologies have been reported by various studies as the following: 3-32 % of neurologic origin, 7-21 % of cardiac origin, 45 % of vasovagal-psychogenic origin, and 35-65 % of idiopathic origin[21-23]. Ammirati *et al* evaluated patients with syncope of unknown origin who constitute 78 % of their study population according to the OESIL criteria and found that 25.9 % of these cases were cardiac syncope, 35.2 % were neurocardiogenic syncope, 13.8 % neurological syncope, and 6.1 % were orthostatic syncope[13]. Baron-Esquivias *et al* reported that 62 % of their cases were neurally-mediated syncope, 16 % cardiac syncope, and 11 % orthostatic syncope[24]. In our study 80 (25.8 %) subjects had neurocardiogenic syncope, 46 (14.8 %) had orthostatic syncope, 31 (10 %) had cardiac syncope, 25 (8.1 %) had neurological syncope, 24 (7.7 %) had metabolically induced syncope, 15 (4.8 %) had hypovolemia-induced syncope, and 89 (28.7 %) had isiopathic syncope. Our figures were in accordance with the literature data. Quinn *et al* evaluated 791 patients presenting to emergency department according to SFSR and followed tham for 30 days[26]. Four hundred and eleven (52 %) patients were deemed high-risk. On follow-up 53 (6.7 %) patients experienced serious outcomes. That sudy reported a sensitivity of 98 % and a specifity of 56 % for SFSR. Çakıroğlu *et al* considered 262 (20.3 %) patients at high risk and 28 (10.7 %) patients suffered serious events during follow-up [27]. Schladenhaufen *et al*[27] conducted a retrospective study in 517 patients aged 65 years or older presenting to emergency department after syncope between 2000 and 2001. Based on SFSR, they considered 98 patients high-risk and 23 patients suffered serious outcomes by 30 days. That study had a sensitivity of 76.5 %, a specifity of 36.8 %, a negative predictive value of 87 % and a positive predictive value of 22.1 %. Enrolling elderly patients only is disadvantageous for the results of the study and causes an excess mortality rate. According to our results, 82 patients were in the high-risk group and 40 patients were admitted to the hospital. It was observed that the at-risk patients were not hospitalized at an ideal rate and this overlapped with the study objective. Our results are in agreement with literature data. Accordingly, we are of the opinion that the prognosis of syncope patients at high risk was worse and use of SFSR would be more appropriate for long-term follow-up of such patients. Middlekauff *et al* found a mortality rate of 45 % that was irrespective of the syncope etiology in 491 patients who had a history of cardiac disease and presented with syncope[28]. Sotariades *et al*[3] followed patients with syncope for 17 years to compare syncope of cardiac origin and syncope of non-cardiac origin and found that syncope of cardiac origin had a higher mortality rate. Çakıroğlu et al reported a mortality rate of 10.3 % in patients with CVS, 9.3 % in patients with malignancy, 6.2 % in patients with CVA, and 4.3 % in patients with DM[26]. We think that the absence of cardiac mortality in our study was the result of the small sample size as well as the short duration of data collection. Two patients, one with idiopathic syncope and the other with orthostatic syncope, died in our study. Hospital admission rates are quite high in patients presenting with syncope. This is not surprising considering the seriousness of the etiologic factors and the need for detailed and advanced testing for making a correct diagnosis. Hence, Blanc *et al* reported a hospital admission rate of 64 %[29]. Disertori *et al* reported a hospitalization rate of 46 %[19]. On the other hand, we reported a lower hospitalization rate of 10.6 %. We feel that this figure deserves attention. We already expected such a low rate at the designing stage of the study and our report of a much lower hospitalization rate than the literature probably originates from lack of use of adequate risk scoring schemes in making decisions about syncope patients.

CONCLUSION

Our study demonstrated that use of SFSR was beneficial in the evaluation and prognosis assessment of patients presenting to emergency department with syncope. We also think that the implementation of risk scoring systems into clinical practice may increase hospital admission rates of patients with high-risk syncope and prevent unnecessary admissions of low-risk patients.

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