

Is Hospital Admission Useful for Syncope Patients?

Preliminary Results of a Multicenter Cohort

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Background

There is no evidence that hospitalization may favorably affect outcomes in patients suffering from syncope.

The optimal design for assessing hospitalization effectiveness on syncope outcomes would be to randomly admit or discharge patients after Emergency Department (ED) evaluation.

However, this approach is unfeasible due to ethical reasons.

Aim

To assess the effect of hospital admission in reducing 30-day mortality and serious outcomes after syncope.

Study population

2574 patients presented to the ED because of syncope, consecutively enrolled in four prospective observational studies.

Costantino et al. 2016; *unpublished*

Costantino et al. J Am Coll Cardiol 2008;51(3):276-83

Reed et al. J Am Coll Cardiol 2010;55(8):713-21

Sun et al. Ann Emerg Med 2007;49(4):420-7

30-day serious outcomes

- All-cause mortality
- PM or ICD implant
- Hospital readmission for syncope

Statistical analysis

Multivariable logistic models including *propensity score adjustment*.

The propensity score was balanced for the following variables: gender, age at presentation, absence of prodromes, trauma following syncope, abnormal ECG, history of cardiovascular disease, history of hypertension, history of previous syncope.

The **propensity score** is the probability of treatment assignment conditional on observed baseline characteristics.

Rosenbaum P.R., Rubin D.B. *Biometrika*. 1983a;70:41–55

Conditional on the propensity score, the distribution of measured baseline covariates is similar between treated and untreated subjects. Thus, in a set of subjects *all of whom have the same propensity score*, the distribution of observed baseline covariates will be the same between the treated and untreated subjects.

Results

Table 1. Demographic and Clinical Features of the Population Studied

	Total (n = 2574)	Admitted (n = 1149)	Discharged (n = 1425)	p value
Age (median, IQR), yrs	66, 35	77, 20	52, 40	<0,01*
Gender, n (%)				<0,01†
Female	1408 (54,7)	584 (50,8)	824 (57,8)	
Male	1166 (45,3)	565 (49,2)	601 (42,2)	
Medical history, n (%)				
Hypertension	640 (24,9)	343 (29,8)	297 (20,8)	<0,01†
Cardiovascular diseases	742 (28,8)	477 (41,5)	265 (18,6)	<0,01†
Cerebrovascular diseases	159 (6,2)	98 (8,5)	61 (4,3)	<0,01†
Index syncope history, n (%)				
During exercise	155 (6,0)	111 (9,7)	44 (3,1)	<0,01†
Absence of prodromal symptoms	851 (33,1)	499 (43,4)	352 (24,7)	<0,01†
Syncopeal recurrences	563 (21,9)	222 (19,3)	341 (23,9)	>0,05†
Abnormal ECG at presentation, n (%)	1138 (44,2)	607 (52,8)	531 (37,3)	<0,01†
Trauma, n (%)	610 (23,7)	304 (26,4)	306 (21,5)	<0,01†

Values expressed as n (%). P value, admitted versus discharged. *Wilcoxon rank-sum test; †chi-square test.

Results-2

Table 2. Adverse 30-day Events in Admitted and Discharged Patients

	Total (n = 2573)	Admitted (n = 1148)	Discharged (n = 1425)	p value
Serious outcomes, n (%)	58 (2,2)	38 (3,3)	20 (1,4)	<0,01†
All cause deaths, n (%)	31 (1,2)	28 (2,4)	3 (0,02)	<0,01*
Hospital readmission, n (%)	12 (0,05)	4 (0,03)	8 (0,06)	>0,05*
PM/ICD insertion	15 (0,06)	6 (0,05)	9 (0,06)	>0,05*

Values expressed as n (%). P value, admitted versus discharged. †Chi-square test. *Fischer's exact test

Results-3

Table 3. Univariable Model for 30-day Serious Outcomes





	Adjusted Odds Ratio	95% Confidence Interval	p value
 Hospital admission	2,40	1,39-4,16	<0,01

Table 4. Multivariable Model for 30-day Serious Outcomes

	Adjusted Odds Ratio	95% Confidence Interval	p value
 Hospital admission	1,02	0,05-2,11	>0,05
 Age	1,04	1,01-1,08	<0,01
Hypertension	1,27	0,58-2,77	>0,05
 Cardiovascular diseases	2,88	1,25-6,61	<0,05
Cerebrovascular diseases	1,25	0,53-2,94	>0,05
Abnormal ECG at presentation	0,97	7,81-23,48	>0,05

Results-4

Table 5. Multivariable Model for 30-day All-Cause Mortality



	Adjusted Odds Ratio	95% Confidence Interval	p value
 Hospital admission	15,13	1,99-115,01	<0,01
Age	1,02	0,99-1,06	>0,05
Cardiovascular diseases	3,08	1,19-8,02	<0,05
Abnormal ECG at presentation	2,05	0,83-7,50	>0,05

Table 6. Multivariable Model for 30-day All-Cause Mortality adjusted for Propensity score

	Adjusted Odds Ratio	95% Confidence Interval	p value
 Hospital admission (Observations N = 637)	10,40	1,20-90,26	<0,05

Limitations of the study

1) Absence of a pre-specified admission protocol

(...ED disposition decision making based exclusively on clinical judgement)

2) Confounding

(...not considered all possible confounders)

Conclusions

Despite propensity score adjustment, our results do not suggest that hospitalization reduces 30 days mortality after ED attendance with syncope.

A possible explanation could be that hospitalization of syncope patients is often not only due to the event itself, but it is rather influenced by additional factors (e.g. co-morbidity, frailty, socio-economic conditions).

...Grazie!

Results-5

Table 5S. Univariable Model for 30-day All-cause mortality

	Adjusted Odds Ratio	95% Confidence Interval	p value
Age	1,06	1,03-1,09	<0,01
Female gender	0,33	0,15-0,73	<0,01
Hypertension	2,69	0,91-7,92	>0,05
Cardiovascular diseases	5,51	2,42-12,57	<0,01
Cerebrovascular diseases	2,26	0,62-8,18	>0,05
Absence of prodromal symptoms	1,45	0,68-3,07	>0,05
Abnormal ECG at presentation	3,65	1,47-9,04	<0,01
Syncopal recurrences	1,51	0,43-5,24	>0,05
Trauma	1,13	0,51-2,52	>0,05
Hospital admission	11,85	3,59-39,08	<0,01

Results-6

Tabella 6S. Demographic and Clinical Features and 30-day Serious Outcomes according to Center

	Total (n = 2574)	BNP 2016 (n=354)	ROSE 2010 (n = 1067)	STePS 2008 (n = 676)	SUN 2007 (n = 477)	p
Age (median, IQR), yrs	66, 35	71, 29	68, 33	64, 37	57, 44	<0,01*
Female, n (%)	1408 (54,7)	175 (49,4)	587 (55,0)	379 (56,1)	267 (56,0)	>0,05†
Male, n (%)	1166 (45,3)	179 (50,6)	480 (45,0)	297 (43,9)	210 (44,0)	
History of Hypertension, n (%)	640 (24,9)	189 (53,4)	. (0,0)	266 (39,3)	185 (38,8)	<0,01†
History of Cardiovascular diseases, n (%)	742 (28,8)	113 (32,0)	284 (26,6)	188 (27,8)	157 (33,0)	<0,01†
History of Cerebrovascular diseases, n (%)	159 (6,2)	28 (7,9)	. (0,0)	92 (13,6)	39 (8,2)	<0,01†
Syncope during exercise, n (%)	155 (6,0)	5 (1,4)	61 (5,7)	15 (2,2)	74 (15,5)	<0,01†
Absence of prodromal symptoms, n (%)	851 (33,1)	110 (31,1)	410 (38,4)	190 (28,1)	141 (29,6)	<0,01†
Syncopal recurrences, n (%)	563 (21,9)	94 (26,5)	. (0,0)	309 (45,7)	160 (33,5)	<0,01†
Abnormal ECG at presentation, n (%)	1138 (44,2)	98 (27,7)	724 (67,8)	215 (31,8)	101 (21,2)	<0,01†
Trauma after syncope, n (%)	610 (23,7)	132 (37,3)	316 (29,6)	162 (24,0)	. (0,0)	<0,01†
Hospital admissions, n (%)	1149 (44,6)	107 (30,2)	538 (33,5)	218 (32,2)	286 (60,0)	<0,01†
30-day Serious outcomes, n (%)	58 (2,2)	18 (5,1)	19 (1,8)	12 (1,8)	9 (1,9)	<0,01†
30-day All-cause deaths, n (%)	31 (1,2)	4 (1,1)	16 (1,5)	8 (1,2)	3 (0,6)	>0,05†

P value, BNP 2016 vs. ROSE 2010 vs. STePS 2008, vs. SUN 2007. *Kruskal–Wallis rank test; †chi-square test.