

The PRehOspital Prediction of in Hospital Emergency Treatment (**PROPHET**) Study

Ospedale
San Gerardo
Sistema Socio Sanitario
Regione

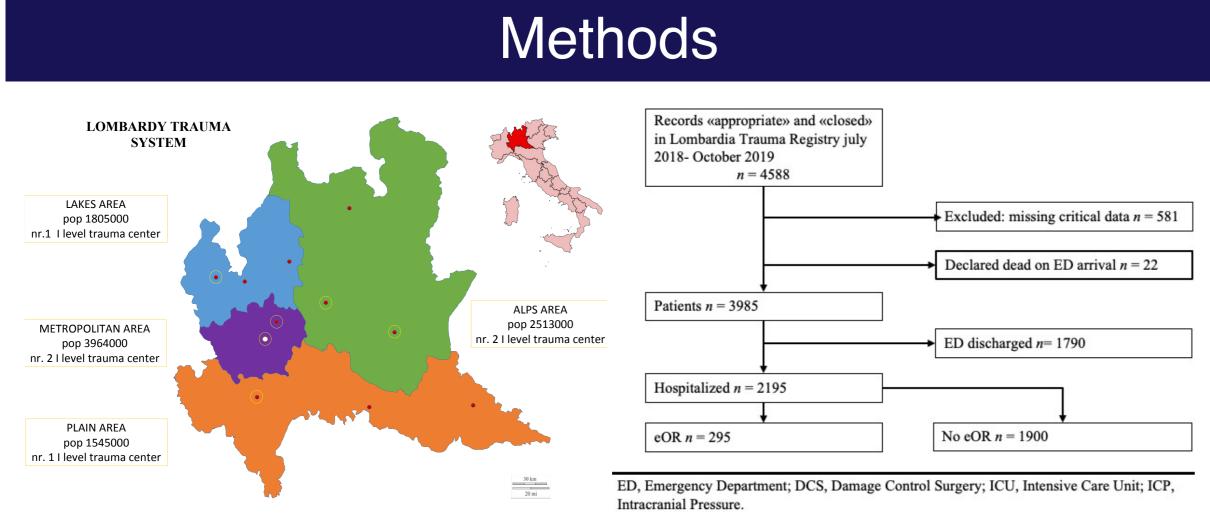
ASST Monza

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Background

Prehospital field triage is often imprecise in identification of the need for an hospital emergent procedure within 6 hours from ED admission (eOR), often leading to OR schedule interruption, inefficient use of resources and higher costs. Aim of Prophet Study is to analyse prehospital factors associated with the need for eOR and to develop a prehospital triage tool to improve hospital allocation.



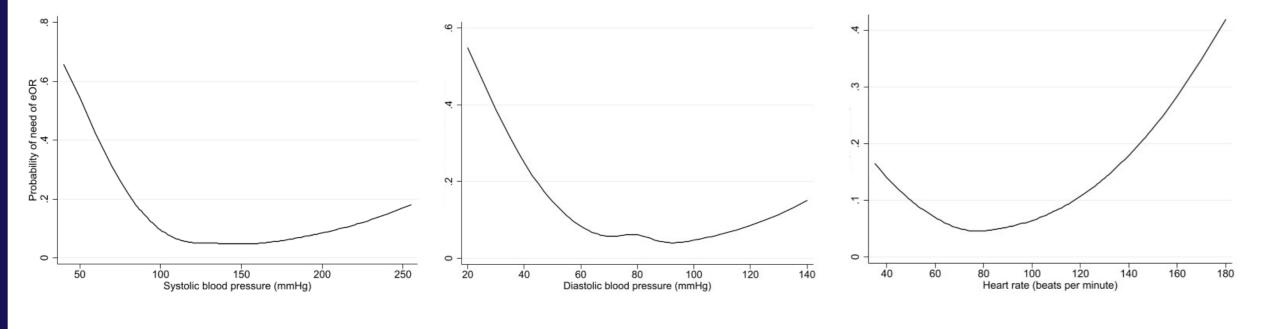
A retrospective observational study was conducted analyzing prehospital and in-hospital consecutive data (July 1st 2018-March 31st 2019) obtained from Lombardy Trauma Registry.

Exclusion criteria were age <18, EMS vehicle not involved, declared dead on the scene or on ED arrival without interventions, missing essential data.

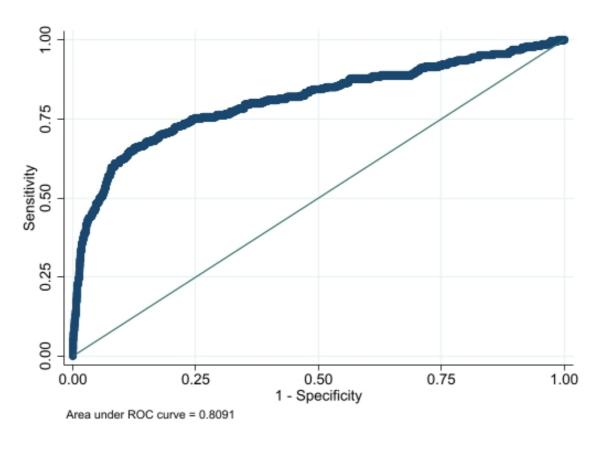
Out of 4588 patients in the Registry, 3985 records were included in the study. Dataset was analyzed with STATA®. A triage score composed by the most significative factors associated with the probability for eOR was subsequent developed.

Results

2195 (54%) patients were hospitalized. 245 patients underwent eOR, 50 patients died before eOR was performed, both representing 7.4% of the global population; 1900 didn't need eOR. eOR were older (53 vs 48 years), with more penetrating injuries (6% vs 3%) and higher ISS (27 vs 7), intubation rate (45% vs 3.9%), ICU (74% vs 27%) and mortality (37% vs 2.3%). Only downfall, among injury mechanics, was significantly higher in eOR group (17.6% vs 7.1%).



Multivariate analysis identified predictive variables independently associated for eOR: penetrating injury, downfall, cardiac arrest, poor neurological status, intubation, systolic hypotension, shock index 0.7-1.3, tachycardia;

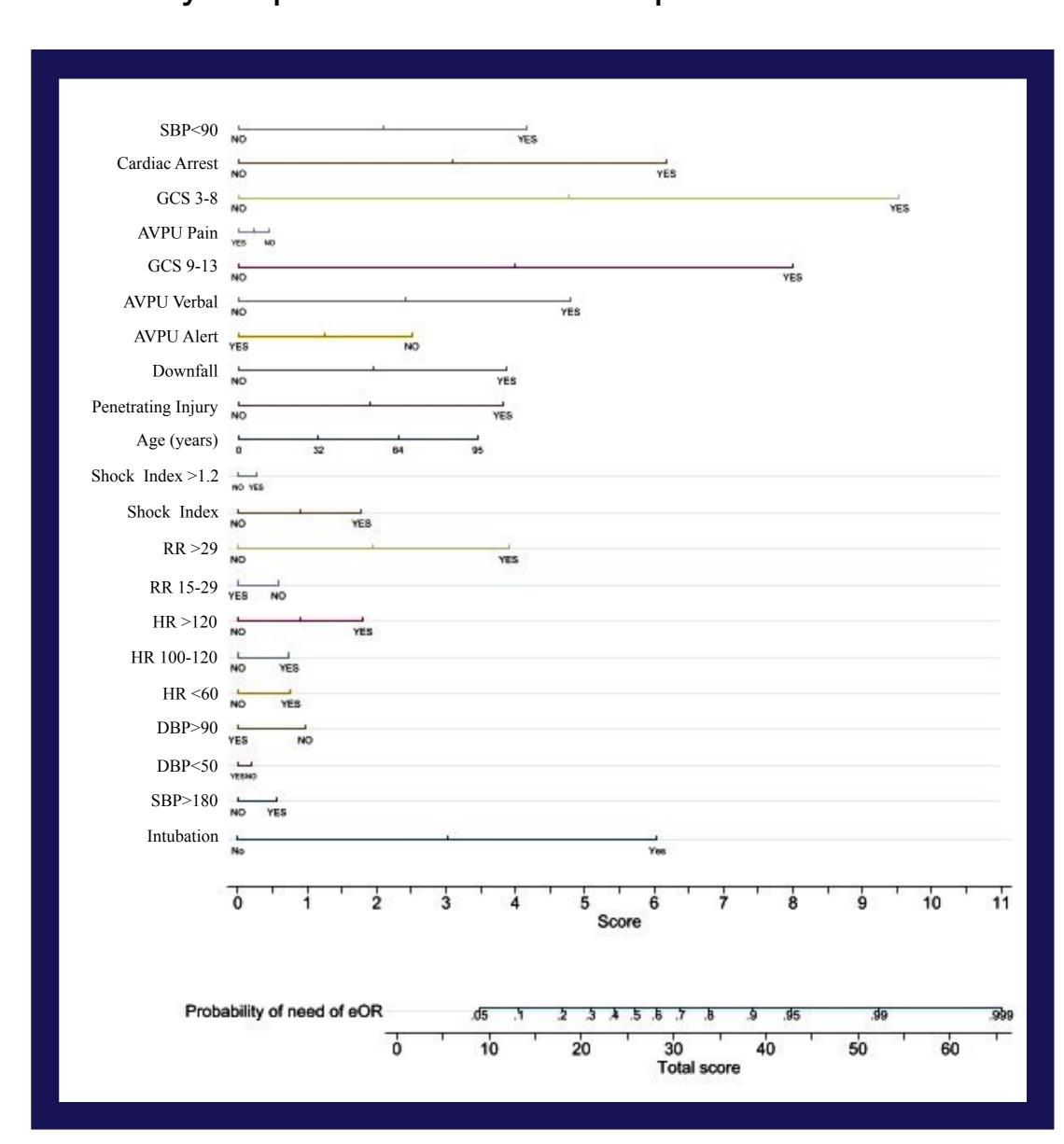


testing our population with a score composed with these variables generate a ROC curve with AUC 0.8.

Univariable and multiva	riable lo	ogistic regression m	nodels on the	e risk of need of EOR.
		univariable a)		multivariable b)
Variable	OR	(95% CI)	<i>p-value</i>	OR (95% CI) p-value
age (years)	1,01	(1,00;1,01)	0,001	1,01 (1,00 ; 1,01) 0,028
penetrating trauma	2,11	(1,27;3,53)	0,004	2,00 (1,10 ; 3,66) 0,024
precipitazione	2,79	(2,02 ; 3,86)	<0,0001	2,03 (1,37 ; 3,00) <0.0001
1) GCS >13		reference		reference
2) AVPU = ALERT	0,57	(0,39;0,85)	0,006	0,63 (0,42 ; 0,96) 0,030
3) AVPU = VERBAL	2,84	(1,19;6,82)	0,019	2,40 (0,94 ; 6,13) 0,068
4) GCS = 9-13	7,01	(4,63;10,63)	< 0.0001	4,30 (2,67 ; 6,92) <0.0001
5) AVPU = PAIN	1,16	(0,15; 8,76)	0,886	0,92 (0,12 ; 7,17) 0,938
6) GCS = 3-8		(16,14;31,31)	< 0.0001	5,70 (3,26 ; 9,99) <0.0001
cardiac arrest SBP*	28,22	(16,95;46,99)	< 0.0001	3,08 (1,60 ; 5,94) 0,001
90-180		reference		reference
<90		(3,93; 9,63)	< 0.0001	2,14 (0,96 ; 4,78) 0,064
>180	,	(0.93; 2.70)	0,089	1,10 (0,56 ; 2,19) 0,777
DBP*	1,39	(0,93,2,70)	0,009	1,10 (0,30 , 2,19) 0,777
50-90		reference		reference
<50	4,34	(2,57 ; 7,33)	< 0.0001	0,97 (0,37 ; 2,55) 0,948
>90	0,69	(0,51;0,92)	0,011	0,84 (0,58 ; 1,22) 0,359
HR*		C		C
60-100		reference	0.002	reference
<60	,	(0,92; 3,13)	0,092	1,14 (0,56 ; 2,35) 0,713
100-120	,	(1,19; 2,27)	0,003	1,14 (0,75 ; 1,72) 0,535
>120 RR*	2,16	(1,28; 3,64)	0,004	1,38 (0,71 ; 2,68) 0,348
<15		reference		reference
15-29	0,66	(0,49 ; 0,88)	0,005	0,90 (0,66 ; 1,24) 0,525
>=30	4,10	(1,99; 8,44)	< 0.0001	1,99 (0,85 ; 4,68) 0,113
shock index		6		C
<0.7		reference	0.001	reference
0.7-1.3	,	(1,21;2,07)	0,001	1,37 (0,95 ; 1,97) 0,089
>=1.3 intubation	,	(4,01;12,61)	<0.0001	1,05 (0,40 ; 2,73) 0,924
	19,94	(15,02;26,48)	<0.0001	2,86 (1,73 ; 4,73) <0.0001
<i>OR</i> =Odds Ratio, * on 39	915 pati	ents		

Conclusions

A score composed by the combination of few prehospital factors may be predictive for subsequent eOR.



Nomomogram. The probability of need of eOR is calculated in three steps: 1) the score of each characteristic of the patient is obtained by the vertical projection (from "NO", "YES" or the values) to the score axis, 2) the total score is then calculated by summing up the single score values, 3) probability of need of eOR is calculated by the vertical projection of the total score value to the to the probability of need of eOR axis