

NEWS2 scale in estimating risk of deterioration in trauma patient admitted to Emergency Department – pilot results.

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INTRODUCTION

Trauma is 3rd cause of death in general population and first in group aged 1-44 years in Europe. [1,2] Because of high incidence rate trauma is a big challenge for emergency departments. Reduction of high mortality is one of the most important objectives and may be achieved by implementing intensive patient treatment in a proper time. That is why segregation and selection systems for patients admitted to Emergency Departments are crucial to identify those in serious condition. [3]

AIM OF THE STUDY

Aim of the study was to compare NEWS2 scores in trauma patients coded “yellow” according to hospital Manchester Triage System and estimate correlation with mortality and length of stay in hospital.

NEWS2 SCALE

Among many different in-hospital triage systems, in 2012 Royal College of Physicians (RCP) implemented NEWS2 score, based on measurements of basic physiological parameters (heart rate, respiratory rate, pulseoximetry, systolic blood pressure, need of oxygen supplementation, level of consciousness, temperature) as one of the most sensitive and specific in discriminating risk of clinical deterioration and acute mortality, becoming gold standard in primary triage and survey in emergency departments in Great Britain. [4]

Chart 1: The NEWS scoring system

Physiological parameter	Score						
	3	2	1	0	1	2	3
Respiration rate (per minute)	≤8		9–11	12–20		21–24	≥25
SpO ₂ Scale 1 (%)	≤91	92–93	94–95	≥96			
SpO ₂ Scale 2 (%)	≤83	84–85	86–87	88–92 ≥93 on air	93–94 on oxygen	95–96 on oxygen	≥97 on oxygen
Air or oxygen?		Oxygen		Air			
Systolic blood pressure (mmHg)	≤90	91–100	101–110	111–219			≥220
Pulse (per minute)	≤40		41–50	51–90	91–110	111–130	≥131
Consciousness				Alert			CVPU
Temperature (°C)	≤35.0		35.1–36.0	36.1–38.0	38.1–39.0	≥39.1	

Chart 2: NEWS thresholds and triggers

NEWS score	Clinical risk	Response
Aggregate score 0–4	Low	Ward-based response
Red score Score of 3 in any individual parameter	Low–medium	Urgent ward-based response*
Aggregate score 5–6	Medium	Key threshold for urgent response*
Aggregate score 7 or more	High	Urgent or emergency response**

* Response by a clinician or team with competence in the assessment and treatment of acutely ill patients and in recognising when the escalation of care to a critical care team is appropriate.

**The response team must also include staff with critical care skills, including airway management.

MATERIALS AND METHODS

The study was based on retrospective analysis of medical history of patients reported to regional Trauma Center (Copernicus Memorial Hospital in Łódź) between 01.01.2015 and 31.12.2017. Inclusion criteria covered: initial traumatic diagnosis, yellow “code” according to Manchester Triage System, age over 16 years old.

For each patient NEWS2 score was calculated, according to RCP guidelines. Results were correlated with mortality, length of stay in hospital and need for intensive care. Statistical analysis was calculated by Statistica 10 software. Statistical significance was $p < 0.05$.

RESULTS

Among 68 593 patients reported to Emergency Department of Regional Trauma Center Copernicus Memorial Hospital in Łódź between 01.01.2015 and

31.12.2017, in 17 817 (26%) cases initial diagnosis was trauma. Finally 704 patients fulfilled inclusion criteria, including 399 females (57%). Mean NEWS2 score was 1.37 ± 1.56 .

Parameter	LR group	SR group	MR group	HR group	TOTAL	p
n (%)	595 (85%)	75 (11%)	25 (4%)	9 (1%)	704	<0.0001
mortality; %	3%	9%	24%	67%	5.3%	<0.0001
mean length of stay in hospital (days)	7.68±8.3	7.2±7.1	10.2±13.1	23.3±31.8	7.95±9.4	0.036
need for ICU admission; n (%)	4 (0.7%)	0	3 (12%)	2 (22%)	9 (1.3%)	<0.0001

Table 1.

Comparison between studied groups according to NEWS2 clinical risk.

75 (11%) patients presented single red score (SR - isolated abnormality in one parameter), while 25 (4%) reached medium risk score (MR - NEWS2 5-6) and 9 (1%) reached high risk score (HR - NEWS2 ≥7). 595 (85%) patients reached low risk score (LR - NEWS2 <5). Mortality in total group was 37 (5.3%), from HR 6, from SR 7, from MR 6, from LR 18. NEWS2 score do not correlated with length of hospital stay with correlation coefficient $r=0.06$ ($p=0.07$), but slightly correlated with need for intensive care $r=0.23$ ($p<0.0001$) and mortality $r=0.2$ ($p<0.0001$).

CONCLUSIONS

NEWS2 is sensitive and specific tool to detect critically ill patients, including trauma patients. According to its score additional monitoring and vigilance should be implemented.

Large quantity of low risk group (LR) among trauma patients coded yellow according to Manchester Triage System may suggest overtriage in admission to Emergency Department.

Although all patients were coded “Yellow” in Manchester Triage System there were fatalities and patients admitted to ICU. Routine practice of NEWS2 may improve alertness and prioritizing patients.

Local protocols and healthcare system organisation may result in lack of correlation between NEWS2 and patient length of stay in hospital.

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Keywords:

Triage, Trauma, Emergency, Intensive Care, NEWS2,