ORIGINAL ARTICLE

Mortality in Code Blue; can APACHE II and PRISM scores be used as markers for prognostication?

Nurten Bakan, M.D., Gülşah Karaören, M.D., Şenay Göksu Tomruk, M.D., Sinem Keskin Kayalar, M.D.

Department of Anaesthesiology and Reanimation, Health Sciences University, İstanbul Ümraniye Training and Research Hospital, İstanbul-*Turkey*

ABSTRACT

BACKGROUND: Code blue (CB) is an emergency call system developed to respond to cardiac and respiratory arrest in hospitals. However, in literature, no scoring system has been reported that can predict mortality in CB procedures. In this study, we aimed to investigate the effectiveness of estimated APACHE II and PRISM scores in the prediction of mortality in patients assessed using CB to retrospectively analyze CB calls.

METHODS: We retrospectively examined 1195 patients who were evaluated by the CB team at our hospital between 2009 and 2013. The demographic data of the patients, diagnosis and relevant de-partments, reasons for CB, cardiopulmonary resuscitation duration, mortality calculated from the APACHE II and PRISM scores, and the actual mortality rates were retrospectively record-ed from CB notification forms and the hospital database.

RESULTS: In all age groups, there was a significant difference between actual mortality rate and the expected mortality rate as estimated using APACHE II and PRISM scores in CB calls ($p<0.05$). The actual mortality rate was significantly lower than the expected mortality.

CONCLUSION: APACHE and PRISM scores with the available parameters will not help predict mortality in CB procedures. Therefore, novels scoring systems using different parameters are needed.

Keywords: APACHE II; code blue; mortality; PRISM.

INTRODUCTION

Code systems are emergency call and management systems for rapid response in healthcare institutions. The primary aim of these systems is to provide common institutional understanding about what is necessary to be done immediately at the time of the event.

Code blue (CB) is used worldwide to define the necessary emergency interventions in cases of respiratory or cardiac arrest,[1] and this was defined in the healthcare quality standards of Turkey in 2008. It is the only color code in which the same color is used for the same emergency worldwide.

The CB process includes the establishment of a professional team, maintaining the alertness of the team, technological call systems, preparation until the team arrives, the time to arrival of the CB team, availability of equipment, and effective intervention and post-intervention management and records. In the last decade, several scoring systems have been used to assess the severity of disease in the emergency department (ED), including Rapid Acute Physiology Score (RAPS), Rapid Emergency Medicine Score (REMS), Glasgow Coma Scale (GCS), Charlson co-morbidity index (CCI), modified Early Warning Score (MEWS), and Worthing physiological scoring system (WPS). However, the majority of these scoring systems are not appropriate for use in ED because most are disease specific, and it is difficult to use the systems in a technical manner or they do not correspond to the ED patient profile. APACHE II and PRISM scores (adult and pediatric, respectively) are accepted for both surgical and medical patients and have been widely used in intensive care units (ICUs) for the last three decades.[2]

Cite this article as: Bakan N, Karaören G, Tomruk ŞG, Keskin Kayalar S. Mortality in Code Blue; can APACHE II and PRISM scores be used as markers for prognostication? Ulus Travma Acil Cerrahi Derg 2018;24:149–155

Address for correspondence: Gülşah Karaören, M.D.
İstanbul Ümraniye Eğitim ve Araştırma Hastanesi, Anesteziyoloji ve Reanimasyon Kliniği, İstanbul, Turkey
Tel: +90 216 - 632 18 18 E-mail: drgyilmaz@yahoo.com

Ulus Travma Acil Cerrahi Derg 2018;24(2):149–155 DOI: 10.5505/tjtes.2017.59940 Submitted: 19.12.2016 Accepted: 21.08.2017 Online: 19.09.2017
Copyright 2018 Turkish Association of Trauma and Emergency Surgery

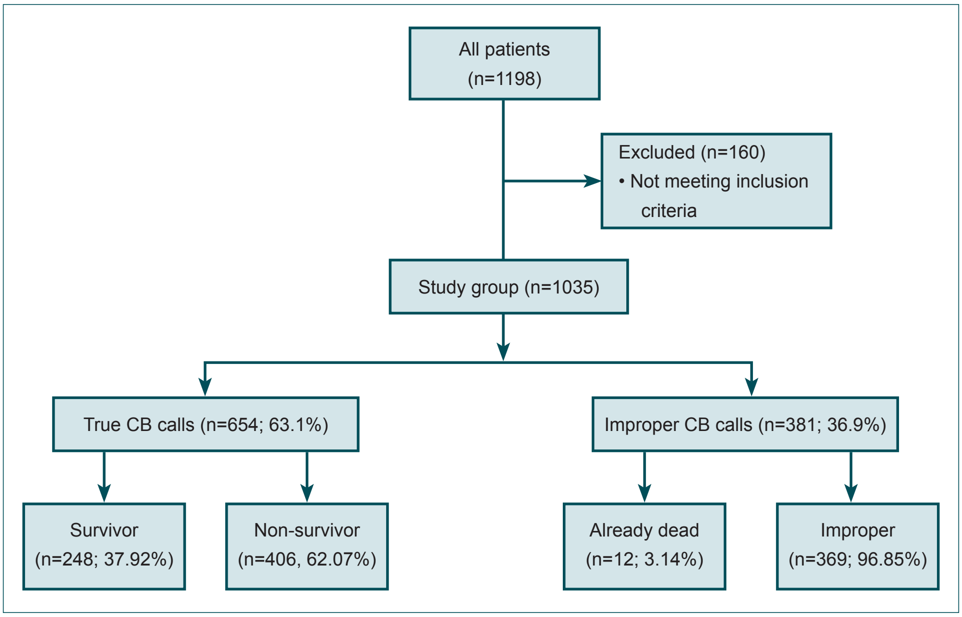

Figure 1. Consort diagram.

The APACHE II and PRISM scores describe the severity of disease by using changes in physiological parameters and can be used to define prognosis of the disease in ICU.[3] The APACHE II score consists of 12 distinct physiological parameters, age, and previous health status. In this system, the parameters including heart rate, systolic blood pressure, body temperature, Fraction of inspired oxygen (FiO_2) electrolytes (sodium, potassium, and bicarbonate), and white blood cell count are rated from 0 to 4 (higher scores indicating extreme measurements). The lowest GCS score is 11 points, while the highest is 71 points; 6 points are assigned to the patients aged >75 years. Chronic diseases are also included in the evaluation.

However, to the best of our knowledge, in literature, there are no scoring systems that have been developed to predict mortality in CB procedures.

The aim of this study was to investigate the effectiveness of the estimated APACHE II and PRISM scores in the prediction of mortality in patients assessed using CB in a 500-bed regional reference hospital between 2009 and 2013 and to retrospectively analyze the CB calls.

MATERIALS AND METHODS

Approval for the study was granted by the Clinical Research Ethics Committee of Health Sciences University, Istanbul Umraniye Research Hospital (Chairman: Sait Naderi, Professor, MD.; Approval#5089/2015).

A retrospective review was made of the CB notification forms completed by an anesthesiologist as a CB team leader between 2009 and 2013. Demographic data, diagnosis at admission, department admitted to, time of CB activation, time to arrival of CB team, reason for CB, data regarding whether CB was true or improper, application of cardiopulmonary resuscitation (CPR), and CPR duration, if applied, were extracted from the CB notification forms. The APACHE II and PRISM scores and the expected mortality rate were calculated from the data on the CB notification forms and hospital database. The APACHE II scoring was used for patients aged >18 years, whereas PRISM scoring was used for those aged <18 years. Patients aged 1–12 months were considered under the age group of 1 year. A CB call was defined as improper if no CPR was applied to the patient, only medical treatment was provided to the patient, or the CB call involved a patient who was already dead. Patient records were excluded from the study if treatment was refused or data were incomplete for the parameters needed to calculate the APACHE II and PRISM scores.

Statistical Analysis

All statistical analyses were performed using IBM SPSS version 22.0. Kruskal–Wallis test was used to compare descriptive data (means, standard deviation), quantitative data, and

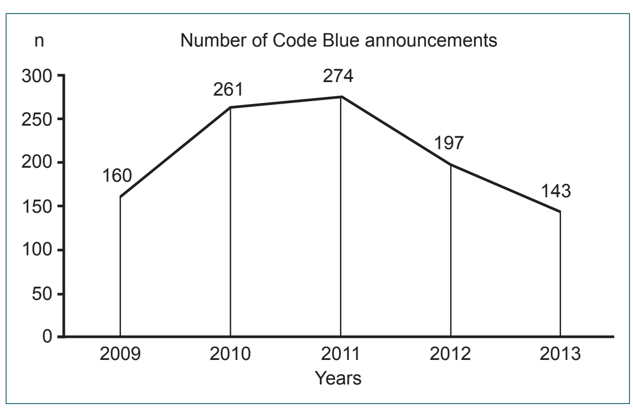

Figure 2. Number of Code Blue announcements according to years.

Table 1. Number of cases, gender, and survival and mortality data according to age groups in true CB calls

	<18 years	18–65 years	>65 years	Total
Number of cases, n (%)	30 (4.6)	238 (36.4)	386 (59)	654
Male, n (%)	18 (4.4)	167 (43.5)	211 (52.1)	405 (61.9)
Female, n (%)	12 (4.8)	62 (25.9)	175 (70.3)	249 (38.07)
Survivor, n	12	95	141	248
Non-survivor, n	18	143	245	406
Survival, %	40.0	39.9	36.50	37.92
Mortality, %	60.0	60.8	63.47	62.08*

[F]isher's Exact test; *p≥0.05; when three groups were compared. CB: Code Blue.

Table 2. Expected and actual mortality rates according to PRISM and APACHE II scores

	Mean±SD	Expected mortality	Actual mortality	p
PRISM				
<18 year	36.7±5.2	87.8%	60%	=0.03*
APACHE II				
18-65 years	37.2±5.6	84.7%	60.10%	<0.05*
>65 years	41.3±5.3	90.6%	63.47%	<0.05*

Chi Square test; *p≤0.05; when three groups were compared.

parameters with skewed distribution between the groups. Mann–Whitney U-test was used to identify the origin of differences and to compare skewed parameters between the groups. For comparing the qualitative data, X^2, Fisher's exact, and Continuity Correction (Yates) tests were applied. Spearman's rho correlation analysis was used to assess the relationship between parameters. P<0.05 was considered significant.

RESULTS

Overall, 1195 CB calls were evaluated during the 5-year period. Of these, 160 patients were excluded from the final analysis as the data needed for prognostic scoring were missing. Of the remaining 1035 patients, CB was evaluated as true in 654 and improper in 381 patients; among the latter, 12 CB activations were for patients who were already dead (Graphic 1).

When the distribution of CB calls was assessed according to year, CB activations were found to be most frequent in 2010 and 2011 (Graphic 2). Of 248 patients with return of spontaneous circulation (ROSC) after CPR, 73 (29.44%) were admitted to our ICU and 175 (70.56%) were admitted to other ICUs after stabilization.

The mean age of 654 patients evaluated as true CB was 64.25±20.6 years, with 59% of these patients aged ≥65 years. No significant difference was detected in mortality between the age groups of <18 years, 18–65 years, and ≥65 years (p>0.05; Table 1).

In true CB calls, a significant difference was detected between the actual and expected mortalities in all age groups (p<0.05), with actual mortality rate being significantly lower (Table 2).

A weak, positive correlation was detected between the expected mortality and age, while there was a strong, posi-

Table 3. Correlation analyses among age, PRISM and APACHE II scores, CPR duration, and expected mortality and actual mortality

	CPR duration	Expected mortality
Age		
r	-0.75	0.255
p	0.056	<0.05
n	654	654
PRISM score		
r	0.464	0.930
p	0.010	<0.05
n	30	30
APACHE II score		
r	0.177	0.910
p	<0.05	<0.05
n	624	624

Spearman's rho test; *p<0.05. CPR: Cardiopulmonary resuscitation.

Table 4. Distribution of true and improper Code Blue calls according to departments

Department	True Code Blue		Improper Code Blue		Total		Improper/True Code Blue
	n	%	n	%	n	%	%
Emergent							
Internal Medicine	284	77.0	85	23	369	10	0.29
Internal Medicine	144	82.3	31	17.7	175	100	0.21
Emergent Surgery	44	41.1	63	58.9	107	100	1.43
Surgery	39	60.0	26	40	65	100	0.66
Orthopedics	29	74.4	10	25.6	39	100	0.34
Emergency Department	27	65.9	14	34.1	41	100	0.51
Gastroenterology	22	81.5	5	18.5	27	100	0.22
Neurology	19	57.6	14	42.4	33	100	0.73
Pediatric Emergency	18	40	27	60	45	100	1.5
Neurosurgery	6	25	18	75	24	100	3
Radiology	5	18.5	22	81.5	27	100	4.4
Chest	4	23.5	13	76.5	17	100	3.25
ETN	4	50	4	50	8	100	1
Urology		42.9	4	57.1	7	100	1.75
Obstetrics & Gynecology	2	22.2	7	77.8	9	100	3.5
Pediatrics	2	50	2	50	4	100	1
Infection Diseases	2	28.6	5	71.4	7	100	2.5
Other	0	0	31	100	31	100	–

tive correlation between expected mortality and PRISM or APACHE II scores (p<0.05; Table 3).

True CB was most frequently announced from the Emergency-internal medicine and Internal Medicine departments, whereas improper CB was most frequently announced from the Emergency-internal medicine and Emergency-surgery departments. The rate of improper CB was found to be highest in the Radiology Department. In the departments classified as miscellaneous, all CB calls were improper (n=1 in pathology department, n=9 in blood sampling unit, n=3 in ophthalmology department, n=16 in outpatient clinics, and n=2 in waiting rooms) (Table 4).

True CB calls involved 250 patients with cardiac disease (38.22%), 105 patients with terminal cancer (16.5%), 77 patients with neurological disease (11.77%), 62 patients with trauma (9.4%), and 54 patients with acute respiratory failure (8.25%).

On assessment of true CB calls, 33.18% (n=217) of true CB calls were found to have been announced during working hours (08:00–16:00) and 66.82% (n=437) were announced out of working hours (16:00–08:00). The distribution of true CB calls was as follows: 5.7% during the period 21:00–22:00; 5.7%, 23:00–24:00; 5.4%, 01:00–02:00; and 5.4%, 16:00–17:00.

Of the improper CB calls, 39.37% (n=217) were found to have been announced during working hours (08:00–16:00) and 60.63% (n=437) were announced out of working hours (16:00–08:00). The distribution of improper CB calls was as

Table 5. Time to arrival of the CB team and CPR duration in true CB calls

	Time to arrival of CB team (s) (Mean±SD)	p
2009	112.25±22.87	<0.001*
2010	102.90±22.99	
2011	104.98±20.53	
2012	98.12±22.40	
2013	93.64±19.91	
	Duration of CPR (min) (Mean±SD)	**p**
<18 years	36.8±21.6	<0.05**
18–65 years	27.5±16.2	
>65 years	26.2±12.9	

Kruskal–Wallis test; *p<0.01 **p<0.05; when three groups were compared. CB: Code Blue; CPR: Cardiopulmonary resuscitation; SD: Standard deviation.

follows: 6.3% during the period 13:00–14:00; 5.3%, 21:00–22:00; and 5.8%, 11:00–12:00.

On assessment of the time to arrival of the CB team, it was found that the time was significantly shortened over the years ($p<0.001$). Regarding CPR duration, no significant difference was found between the groups aged 18–65 years and >65 years but the duration was significantly longer in the age group <18 years ($p<0.05$) (Table 5). No correlation was detected between CPR duration and age in true CB calls, while there was a significant, moderate positive correlation between CPR duration and PRISM or APACHE II scores ($p<0.05$; Table 3).

DISCUSSION

This study was conducted in a tertiary, training hospital with 25 ICU beds, where the mean number of ED visits is 1200 per year. A comparison was made between the CB call data at our hospital and the information in literature. The primary outcome measure of the expected mortality as estimated using PRISM and APACHE scores was found to be significantly higher than the actual mortality. Therefore, it was concluded that the APACHE II and PRISM scores are not useful in the prediction of mortality in CB calls and that CB call applications were successful in accordance with literature.

Different scoring systems have been developed for the assessment of disease severity in EDs. These scoring systems are the mainstay of the management for critical illnesses, and the common goal of determining disease severity requires the objective measurement of changes in different physiological parameters, which must be recognizable by all clinicians. In ED, an ideal scoring system should include a limited number of physiological variables, which can be obtained on presentation to ED, and it should also accurately predict clinically important outcomes. RAPS, REMS, GCS, CCI, MEWS, and WPS are the most intensively studied scoring systems. However, according to the literature, none of these scoring systems has reached the highest level of evidence.[2]

In many studies, it has been reported that the disorder present before arrest has an effect on survival.[4,5] However, there is no scoring system used in the prediction of mortality in CB patients. In this study, a comparison was made between the expected and actual mortality rates and an assessment was made of the PRISM and APACHE II scores in all true CB calls to evaluate the effectiveness of CB procedures and treatments as well as the usefulness of the PRISM and APACHE scores in CB procedures.

The results of this study showed that the expected mortality rates as estimated using prognostic scoring systems were significantly higher than the actual mortality rates. However, a significant, moderate positive correlation was detected the CPR duration and APACHE II and PRISM scores. This was attributed to a shorter response time to CPR in patients with lower APACHE II and PRISM scores. In conclusion, it was found that expected mortality was increased by an increasing number of comorbidities and CPR duration was increased due to lack of rapid response to CPR.

The most important issue is the time to arrival of the CB team. Previous studies have confirmed that the likelihood of survival is increased by a shorter arrival time of the CB team and early defibrillation.[3,6] In the American Heart Association guidelines, it is aimed to initiate interventions and to provide the first electric shock within 2 min.[7–9] Thus, CPR should be started within 3 min.[10] This is also defined as a parameter in the Quality Standard of the Turkish Ministry of Health.

In the present study, the time to arrival of the CB team ranged from 60 to 170 s (mean: 93.64 s), which is in accordance with the target time. The team organization, physical conditions of our hospital (40.000 m^2 on three floors, with the Anesthesiology Department on the first floor), and regular training can be considered to have been effective in this result. In addition, field exercises performed by the quality department are also effective in maintaining a dynamic process.

Reports in literature have stated that cardiac arrest is more commonly seen among males (56%–69.9%) and cardiac problems are the leading cause of cardiac arrest.[6,7,10] The lower incidence of arrest among females could be due to the lower prevalence of coronary syndromes among females.[7] In the present study, CB calls more commonly involved male patients and cardiac problems were the most common reason for CB calls, which was consistent with literature.

CPR duration is known to be another important factor affecting prognosis in CPR.[3,11] It has been reported that the mortality rate is higher in cases with CPR duration >10 min, while the survival rate is increased in cases with successful CPR with a duration <10 min.[3,10–14] Several studies have examined the optimal CPR duration, with reported CPR durations ranging from 12 to 30.5 min,[11–13] and this may be longer in pediatric patients.[14] In the present study, CPR duration was longer in the age group of <18 years (36.8±21.6 min) than in other age groups, in agreement with literature ($p<0.05$).

In CB procedures, mortality is still high reaching up to 85% despite medical advances and the evolution of CB teams[13] and survival rates range from 13% to 40%.[3,15–17] In this study, the mortality rate in the CB procedures was found to be 62.61% and the survival rate was 38.07%.

True CB calls were often announced out of working hours (66.82%), including immediately after working hours and before midnight. Both periods represent the beginning of out of work (after 16:00) and before sleeping (21:00–02:00) hours. Improper CB calls were often announced at the times of lunch and dinner and before midnight (19:00–20:00, 11:00–

14:00, and 16:00–17:00). These findings suggest that CB procedures do not involve the same conditions over 24 hours.

Although the effects of CB activation time on mortality were not investigated in the current study, in a previous study by Pembeci et al., it was reported that mortality is lower in CB calls activated during working hours.[18]

Initial rhythm is also an important indicator for prognostication. It has been reported that the likelihood of survival and disposition is higher in patients with VT/VNT than in those with asystole.[6,7] In a study on CPR and early defibrillation in an adult in-patient setting, Spearpoint et al. reported that the primary cause of the cardiac arrests was VT/VF in 25% of cases, defibrillation was performed within the first 2 min, and 90% of cases responded to CPR.[19] Delayed defibrillation has been associated with a decreased survival rate, with a 10% decrease in survival for each minute.[20] One of the limitations of this study was the inability to use initial rhythm in prognostication due to insufficient data. However, there are defibrillators in all the wards and in ED in our hospital, and portable emergency kits are available at certain points. Given the short time to arrival of the CB team observed in this study, it can be suggested that this did not lead to any disadvantage.

In a study of 134 patients assessed due to CB activation, Pembeci et al. found the immediate survival rate to be 49%.[18] In the current study, the immediate survival rate was determined to be 37.92% for 654 CB calls. This difference could be attributed to many factors, including the time of CPR, the number of anesthesiologists in the CPR team, the experience of the anesthesiologist, and monitorization conditions etc. Of 248 patients with ROSC after CPR, 73 (29.44%) were admitted to the anesthesia ICU and 175 were admitted to other ICUs. Of the 73 patients admitted to the anesthesia ICU, 15 (20.54%) were discharged, but survival data was not collected for the patients admitted to other ICUs after stabilization. Thus, the mortality data of all patients could not be calculated, which could be considered another limitation of this study.

Conclusion

The results of this study demonstrated that the CB process in our hospital was being successfully implemented in accordance with literature. It was also determined that expected mortality should be known to be able to establish standardization when assessing CB procedures; furthermore, APACHE II and PRISM scores with the parameters available are not helpful in the prediction of mortality in CB procedures. It was therefore concluded that there is a need for novel scoring systems using different parameters in CB procedures.

Acknowledgements

The authors thank Arzu Baygul for statistical analysis of the data and Gokmen Sakar for English editing. This study was presented as a poster presentation in part at the "ISICEM, 35th International Symposium on Intensive Care and Emergency Medicine, March 17–20, 2015, in Brussels, Belgium.

Conflict of interest: None declared.

REFERENCES

1. Sahin KE, Ozdinc OZ, Yoldas S, Goktay A, Dorak S. Code Blue evaluation in children's hospital. World J Emerg Med 2016;7:208–12. [CrossRef]
2. Brabrand M, Folkestad L, Clausen NG, Knudsen T, Hallas J. Risk scoring systems for adults admitted to the emergency department: a systematic review. Scand J Trauma Resusc Emerg Med 2010;18:8. [CrossRef]
3. Mendes A, Carvalho F, Dias C, Granja C. In-hospital cardiac arrest: factors in the decision not to resuscitate. The impact of an organized in-hospital emergency system. Rev Port Cardiol 2009;28:131–41.
4. Sandroni C, Barelli A, Piazza O, Proietti R, Mastria D, Boninsegna R. What is the best test to predict outcome after prolonged cardiac arrest? Eur J Emerg Med 1995;2:33–7. [CrossRef]
5. Herlitz J, Rundqvist S, Bång A, Aune S, Lundström G, Ekström L, et al. Is there a difference between women and men in characteristics and outcome after in hospital cardiac arrest? Resuscitation 2001;49:15–23.
6. Saghafinia M, Motamedi MH, Piryaie M, Rafati H, Saghafi A, Jalali A, et al. Survival after in-hospital cardiopulmonary resuscitation in a major referral center. Saudi J Anaesth 2010;4:68–71. [CrossRef]
7. Villamaria FJ, Pliego JF, Wehbe-Janek H, Coker N, Rajab MH, Sibbitt S, et al. Using simulation to orient code blue teams to a new hospital facility. Simul Healthc 2008;3:209–16. [CrossRef]
8. Brindley PG, Markland DM, Mayers I, Kutsogiannis DJ. Predictors of survival following in-hospital adult cardiopulmonary resuscitation. CMAJ 2002;167:343–8.
9. Abella BS, Alvarado JP, Myklebust H, Edelson DP, Barry A, O'Hearn N, et al. Quality of cardiopulmonary resuscitation during in-hospital cardiac arrest. JAMA 2005;293:305–10. [CrossRef]
10. Field JM, Hazinski MF, Sayre MR, Chameides L, Schexnayder SM, Hemphill R, et al. Part 1: executive summary: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation 2010;122:S640–56. [CrossRef]
11. Goldberger ZD, Chan PS, Berg RA, Kronick SL, Cooke CR, Lu M, et al; American Heart Association Get With The Guidelines—Resuscitation (formerly National Registry of Cardiopulmonary Resuscitation) Investigators. Duration of resuscitation efforts and survival after in-hospital cardiac arrest: an observational study. Lancet 2012;380:1473-81.
12. Nadkarni VM, Larkin GL, Peberdy MA, Carey SM, Kaye W, Mancini ME, et al. First documented rhythm and clinical outcome from in-hospital cardiac arrest among children and adults. JAMA 2006;295:50–7.
13. Möhnle P, Huge V, Polasek J, Weig I, Atzinger R, Kreimeier U, et al. Survival after cardiac arrest and changing task profile of the cardiac arrest team in a tertiary care center. ScientificWorldJournal 2012;2012:294512. [CrossRef]
14. Kleinman ME, Chameides L, Schexnayder SM, Samson RA, Hazinski MF, Atkins DL, et al; American Heart Association. Pediatric advanced life support: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Pediatrics 2010;126:e1361–99. [CrossRef]
15. Peters R, Boyde M. Improving survival after in-hospital cardiac arrest: the Australian experience. Am J Crit Care 2007;16:240–6.

16. Peberdy MA, Ornato JP, Larkin GL, Braithwaite RS, Kashner TM, Carey SM, et al; National Registry of Cardiopulmonary Resuscitation Investigators. Survival from in-hospital cardiac arrest during nights and weekends. JAMA 2008;299:785–92. [CrossRef]
17. Mondrup F, Brabrand M, Folkestad L, Oxlund J, Wiborg KR, Sand NP, et al. In-hospital resuscitation evaluated by in situ simulation: a prospective simulation study. Scand J Trauma Resusc Emerg Med 2011;19:55.
18. Pembeci K, Yildirim A, Turan E, Buget M, Camci E, Senturk M, et al. Assessment of the success of cardiopulmonary resuscitation attempts performed in a Turkish university hospital. Resuscitation 2006;68:221–9.
19. Spearpoint KG, McLean CP, Zideman DA. Early defibrillation and the chain of survival in 'in-hospital' adult cardiac arrest; minutes count. Resuscitation 2000;44:165–9. [CrossRef]
20. Nolan JP, Soar J, Cariou A, Cronberg T, Moulaert VR, Deakin CD, et al. European Resuscitation Council and European Society of Intensive Care Medicine Guidelines for Post-resuscitation Care 2015: Section 5 of the European Resuscitation Council Guidelines for Resuscitation 2015. Resuscitation 2015;95:202–22. [CrossRef]

ORİJİNAL ÇALIŞMA - *ÖZET*

Mavi Kod'da Mortalite; Apache II ve PRISM skorları, prognoz için belirteç olabilir mi?

Dr. Nurten Bakan, Dr. Gülşah Karaören, Dr. Şenay Göksu Tomruk, Dr. Sinem Keskin Kayalar

Sağlık Bilimleri Üniversitesi, İstanbul Ümraniye Eğitim ve Araştırma Hastanesi, Anesteziyoloji ve Reanimasyon Kliniği, İstanbul

AMAÇ: Mavi Kod, hastanelerde kalp ve solunum arrestine yanıt vermek üzere geliştirilmiş acil çağrı sistemidir. Ancak, literatürde Mavi Kod işlemlerinde mortaliteyi öngörmek için bir skor sistemi geliştirilmemiştir. Bu çalışmada Mavi Kod ile değerlendirilen hastalarda mortalite tahmininde hesaplanan APACHE II ve PRISM skorlarının etkinliğinin araştırılması ve Mavi Kod çağrılarının geriye dönük analizi amaçlandı.
GEREÇ VE YÖNTEM: Hastanemizde 2009 ile 2013 yılları arasında Mavi Kod ekibi tarafından değerlendirilen 1195 hasta geriye dönük olarak incelendi. Hastalara ait demografik veriler, tanı ve ilişkili bölümler, Mavi Kod nedenleri, kardiyopulmoner resüsitasyon süresi, APACHE II ve PRISM skorları ile hesaplanan mortalite ve gerçekleşen mortalite değerleri hastane veritabanı ile Mavi Kod Bildirim Formlarından geriye dönük olarak kayıt edildi.
BULGULAR: Mavi Kod çağrılarında gerçek mortalite ile APACHE II ve PRISM skorları tarafından hesaplanan beklenen mortalite arasında tüm yaş gruplarında anlamlı fark vardı ($p<0.05$). Gerçek mortalite oranı beklenen mortaliteden anlamlı derecede daha düşüktü.
TARTIŞMA: Mevcut parametrelerle APACHE ve PRISM skorları, Mavi Kod işlemlerinde mortalitenin öngörülmesine yardımcı olmayacaktır. Bu yüzden, farklı parametrelerin kullanıldığı yeni skor sistemlerine gereksinim vardır.
Anahtar sözcükler: APACHE II; Mavi Kod; mortalite; PRISM.

Ulus Travma Acil Cerrahi Derg 2018;24(2):149–155 doi: 10.5505/tjtes.2017.59940