Does Acute Kidney Injury Condition Affect Revised BAUX Score in Predicting Mortality in Major Burn Patients?

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ABSTRACT
Objective: This study aimed to assess the accuracy of the revised BAUX score for predicting mortality among the major burn patients with acute kidney injury (AKI) compared with non-AKI group. The epidemiologic information and risk factors of AKI in major burn patients were also the point of interest.
Methods: This study was a retrospective cohort study. The medical records of 144 major burn patients admitted at the burns unit of Siriraj Hospital from 2010-2016 were reviewed and important data were retrieved.
Results: Age, hypertension, diabetes mellitus, severity of the burn injuries, and inhalation injuries were the factors related to AKI in major burn patients. The mortality rate due to AKI in burn patients was high (44.4%). The accuracy of the revised BAUX score in predicting the mortality among the major burn patients from our series was only fair (66.7%).
Conclusion: AKI affected on mortality of the major burn patients. Until the better predictor comes up, the revised BAUX score should be considered as a predictor of mortality in these patients.

Keywords: Acute kidney injury; acute renal failure; major burns; mortality rate; revised BAUX score (Siriraj Med J 2019;71: 150-157)

INTRODUCTION

In 2016, of the 447 burn patients treated at Siriraj Hospital, 62 were admitted to the burns unit. The length of stay per case averaged 23 days, costing about US$11,000 per admission. In addition, many hundreds of thousands of Thais in the wider population receive burns every year. This data suggests that millions of dollars are being spent by the government every year to pay for medical treatment related to burns. Better burn treatment can save money, but the most important objective for improving care is to enhance the quality of life of burn victims, which is priceless.

A systemic response after a burn injury occurs after at least 15% of the total body surface area is involved.[1,2] Proinflammatory cytokines are secreted and stimulate the body into a hypermetabolic phase in preparation for stress. Copious intravascular fluid leakage, the signature phenomenal response of endothelial cells to the proinflammatory cytokines, is one of the crucial phases that can result in edema formation in non-burned tissues. This can progress to burn shock if a burn patient receives inadequate fluid resuscitation treatment. An acute kidney injury in a burn victim can happen from many pathways, such as a poor resuscitation process or a hyper-response of the body to the kidney itself due to the secretion of pro-inflammatory cytokines. This condition can result in an increased mortality rate for burn victims, especially among major burn patients.

Acute kidney injury was defined by the Acute Dialysis Quality Initiative Group, which was founded

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by nephrologists and intensivists. It was classified into 3 stages: risk (R), injury (I), and failure (F). The consequences of this condition are divided into 2 groups: sustained loss of kidney function (L), and end-stage kidney disease (E). The 3 stages and 2 groups combine to form the acronym, RIFLE. The RIFLE criteria[3] are used with critically-ill patients to form an early diagnosis of acute kidney injury conditions in order to decrease the mortality rate of this group of patients.[4,5] However, the criteria are limited by the availability of the baseline creatinine value of a patient for use as part of the basic data in the criteria. Consequently, the Acute Kidney Injury Network criteria (AKIN criteria) were developed by the Acute Kidney Injury Network (AKIN) to provide a more accurate tool than the RIFLE criteria for the diagnosis of acute kidney injuries. The AKIN criteria classifies acute kidney injuries into 3 stages, based on the method of treatment.[6,7]

It has been reported that the mortality rate of critically-ill patients with acute kidney injuries varies from 10%–100%, depending on the type of illness.[8] Another study reported a 34.9% (mean: 41.9%) mortality rate for burn patients with acute kidney injuries, which is 5–6 times higher than the mortality rate of non-AKI burn patients.[9] Even when a sub-group of AKI patients in that study received renal replacement therapy (RRT) for the treatment of renal failure, their mortality rate was still very high at 80%.[9]

The revised BAUX score has been reported as the most accurate score for predicting mortality due to burns. This score's factors are age, percentage of total body surface area (%TBSA) burn, and inhalation injuries.[10] A revised BAUX score of ≥ 100 is equivalent to a prediction of a 100% mortality rate.

$$\text{Revised BAUX score} = \text{Age} + \%\text{TBSA} + 17x$$

(x as inhalation injury: 1 = yes, 0 = no)

To make it more convenient to calculate the score, it was developed into nomogram form.[11] Nevertheless, an acute kidney injury condition is still not one of the factors used to calculate the score.

MATERIALS AND METHODS

This studied was conducted with the approval of the Ethics Committee of Siriraj Hospital (Si 690/2016). The subjects were ≥ 20% total body surface area burn injury patients who had been admitted to the burns unit of Siriraj Hospital from 2010–2016. Those patients aged < 18 years or with a history of diagnosed chronic kidney disease were excluded, as were patients who had incomplete medical records. Of the 190 patients screened for the study, 46 were excluded due to having incomplete data, leaving 144 burn patients to be analyzed. The RIFLE and AKIN criterias were used to define the AKI group and to classify the severity of their burns. The qualitative data comprised of sex, underlying diseases, type of burn injury, with-inhalation injury, and any episode of hypotension in the first 24 hours post-injury (hypotension was defined as a systolic blood pressure of < 90 mmHg). These were presented as mean ± SD or median (IQR: percentile 25, percentile 75) and frequency (%). The continuous data comprised of age, length of hospital stay (days), %TBSA burn, length of ventilator use (days), and the volume of intravenous fluids for resuscitation in the first 24 hours post-injury and the second 24 hours post-injury; these were presented as frequency (%).

The program Statistical Package for Social Science (SPSS) version 18.0 was used to analyze the data. The independent t-test was used to analyze continuous data, while the Mann–Whitney test, Chi-square test and Fisher's exact test were used for the categorical data. A p-value less than 0.05 was considered to be statistically significant.

Factors associated with acute kidney injury were presented as odds ratio (95% confidence interval). The p-value corresponds to the logistic regression analysis. The association between the revised BAUX score and the AKI-with-mortality rate were analyzed by logistic regression analysis and presented as odds ratio (OR) with a 95% confidence interval (95% CI). The accuracy of the revised BAUX score in predicting mortality in the AKI group of burn patients was calculated from AUC.

RESULTS

The demographic data are in Table 1. The majority of the burn patients were male (75.7%), and the mean age of all burn victims was 44.09 ± 18.58 years. Essential hypertension was the most common underlying disease, followed by diabetes mellitus. The average size of the burn injuries was 41.75%TBSA, and most injuries had been caused by flame burn. The AKI group was older than the non-AKI group (49.97 ± 20.2 vs. 39.52 ± 15.88 years, respectively, $p = 0.001$). The average injury of the AKI group was more severe than that of the non-AKI group (%TBSA 55% vs. 35%, respectively, $p < 0.001$, with an incidence of > 60%TBSA 25 vs. 9, respectively, $p < 0.001$). Inhalation injuries were mostly found in the AKI group (27 vs. 19, respectively, $p = 0.019$). Most patients in the AKI group required ventilator support (80.9% vs. 30.9%, respectively, $p < 0.001$), and the length of ventilator use was longer for the AKI than the non-AKI group (19 vs. 7 days, respectively, $p = 0.001$). The

TABLE 1. Demographic data.

Factors	AKI group (n=63)	Non-AKI group (n=81)	Total (n=144)	P-value
Mean age (years)	49.97 ± 20.2	39.52 ± 15.88	44.09 ± 18.58	0.001*
Sex (Male:female)	48(76.2%):15(23.8%)	61(75.3%):20(24.7%)	109(75.7%):35(24.3%)	
Underlying diseases				
– HT	15(23.8%)	6(7.4%)	21(14.6%)	0.008*
– DM	6(9.5%)	1(1.2%)	7(4.9%)	0.043*
– DLP	5(7.9%)	2(2.5%)	7(4.9%)	0.24
– Coronary artery disease	2(3.2%)	1(1.2%)	3(2.1%)	0.581
– Gout	0(0%)	1(1.2%)	1(0.7%)	1
– Cirrhosis	1(1.6%)	0(0%)	1(0.7%)	0.438
– Asthma	0(0%)	3(3.7%)	3(2.1%)	0.257
– COPD	1(1.6%)	0(0%)	1(0.7%)	0.438
– Other eg. CVA, Parkinson disease, etc.	10(15.9%)	11(13.6%)	21(14.6%)	0.813
Type of burn injury				
– Flame burn	51(81%)	53(65.4%)	104(72.2%)	0.042*
– Scald burn	6(9.5%)	10(12.3%)	16(11.1%)	0.79
– Electrical burn	5(7.9%)	18(22.2%)	23(16%)	0.023*
– Other eg. contact hot objects.	1(1.6%)	0(0%)	1(0.7%)	0.438
%TBSA (IQR)	55(38.5,73)	35(25,46)	41.75(30,60)	<0.001*
Depth burn wound				
– 2nd degree (IQR)	49(30,63)	35(25,50)	38(28,58)	0.015*
– 3rd degree (IQR)	36.5(15,43.5)	15(10,37.5)	28(10,40)	0.225
Inhalation injury	27(42.9%)	19(23.5%)	46(31.9%)	0.019*
Length of hospital stay, day (LOS) (IQR)	36(17,60)	31(20,54)	34.5(18.5,56.5)	0.622
Ventilator used	51(80.9%)	25(30.9%)	76(52.8%)	<0.001*
Total ventilator days (IQR)	19 (10,38.5)	7 (5,11)	13 (7,26)	<0.001*
1st 24 h fluid (mL) (IQR)	12,967 (9,800,19,000)	9,656 (6,630,13,982)	11,679 (7,180,17,236)	0.001*
1st 24 h fluid (mL/kg/%TBSA) (IQR)	4.05 (2.93,5.29)	4.21 (3.07,5.45)	4.07 (2.98,5.33)	0.413
2nd 24 h fluid (mL) (IQR)	8,640 (7,100,10,513)	5,950 (4,800,7860)	7,378.5 (5,360,8,985)	<0.001*
2nd 24 h fluid (mL/kg/%TBSA) (IQR)	2.44 (1.73,3.08)	2.48 (1.79,3.29)	2.47 (1.75,3.2)	0.417
Hx of Hypotension in 1st 24 h (SBP < 90 mmHg)	16(25.4%)	4(4.9%)	20(13.9%)	0.001*

* P-value < 0.05 **Abbreviations:** HT = essential hypertension; DM = diabetes mellitus; DLP = dyslipidemia; COPD = chronic obstructive pulmonary disease; CVA = cerebrovascular disease; IQR = interquartile range (25th percentile, 75th percentile); h = hours; %TBSA = % total body surface area burn; SBP = systolic blood pressure.

AKI group required more fluid resuscitation in the first and second 24 hours post-injury, and also developed hypotension more often than the non-AKI group in the first 24 hours post-injury.

The APACHE II scores calculated for both groups are in Table 2. The APACHE II score for the AKI group was significantly higher than that for the non-AKI group (16.86 ± 8.16 vs. 6.49 ± 4.39, $p < 0.001$). Parameters for the two groups (such as GCS, MAP, RR, FiO_2, arterial pH, Hct, serum HCO3 and serum creatinine) differed significantly.

A logistic regression was performed to calculate the odds ratio of the factors (Table 3). The odds ratio of patients needing to use a ventilator was very high at 11.23. The DM and HT odds ratios were 8.42 and 3.91, respectively. The odds ratio for a history of hypotension in the first 24 hours post injury was 6.55. Extensive injury > 60%TBSA showed an odds ratio of 5.26, while inhalation injury had an odds ratio of 2.45.

63 patients were diagnosed with AKI (Table 4). The highest incidence of AKI (29) occurred with RIFLE-Risk and AKIN stage 1; all of the patients in those two categories were successfully treated using conservative treatment with medication. A total of 13 other patients received renal replacement therapy; 12 of those patients were RIFLE-Failure, while the 13th was RIFLE-Loss; and all 13 were in AKIN stage 3.

The incidences of mortality at 28 days and at 6 months were significantly higher for the AKI group, with $p < 0.001$ (Table 5). Revised BAUX scores were calculated for each group. The score for the AKI group (115.59 ± 27.73) was higher than that for the non-AKI group (82.56 ± 24.41), with $p < 0.001$ (a revised BAUX score ≥ 100 predicts 100% mortality rate[10,12]). The revised BAUX scores were also significantly higher for the dead patients in both groups (Table 6).

Both the revised BAUX scores and AKI in Table 7 are also related to the mortality rate from multivariate analysis, with OR 1.04, $p < 0.001$ and OR 8.69, $p = 0.002$, respectively.

DISCUSSION

In the past, AKI in burns was considered to be caused by hypovolemia resulting from inadequate volume resuscitation in the first 24 hours, post injury.[13,14] Historically, Parkland's formula was used to determine

TABLE 2. APACHE II scores.

Factors	AKI group (n=63)	Non-AKI group (n=81)	Total (n=144)	P-value
APACHE II score	16.86 ± 8.16	6.49 ± 4.39	11.03 ± 8.14	<0.001*
– GCS	10.87 ± 2.72	13.89 ± 2.09	12.57 ± 2.81	<0.001*
– BT (*C)	37.92 ± 0.84	37.89 ± 0.64	37.9 ± 0.74	0.833
– MAP (mmHg)	86.35 ± 11.39	90.8 ± 10.5	88.85 ± 11.08	0.016*
– HR (beat/min)	131.43 ± 126.17	107.64 ± 16.28	118.05 ± 84.79	0.095
– RR (per min)	21.84 ± 4.86	20.17 ± 2.08	20.9 ± 3.66	0.013*
– FiO_2	0.5 ± 0.2	0.42 ± 0.09	0.45 ± 0.15	0.004*
– PaO_2 (mmHg)	134.07 ± 80.28	116.43 ± 52.36	124.15 ± 66.37	0.134
– Arterial pH	7.32 ± 0.11	7.38 ± 0.05	7.34 ± 0.1	0.048*
– Serum HCO_3 (mmol/L)	19.87 ± 5.01	23.9 ± 3.75	22.14 ± 4.78	<0.001*
– Na (mmol/L)	134.54 ± 25.03	137.85 ± 4.14	136.4 ± 16.85	0.303
– K (mmol/L)	4.21 ± 0.76	4.09 ± 0.59	4.14 ± 0.67	0.28
– Serum Cr (mg/dL)	2.01 ± 1.58	0.77 ± 0.25	1.31 ± 1.23	<0.001*
– Hct (%)	35.93 ± 11.19	40.71 ± 8.6	38.62 ± 10.06	0.006*
– WBC (cells/mm^3) (IQR)	14,110 (5,960, 21,860)	10,920 (6,800, 16,010)	11,645 (6,560, 18,025)	0.232

Data is presented as mean ± SD, *p-value < 0.05. **Abbreviations:** APACHE II = Acute Physiology and Chronic Health Evaluation version II; GCS = Glasgow Coma Score; BT = body temperature; MAP = mean arterial pressure; HR = heart rate, RR = respiratory rate, IQR = interquartile range (25^{th} percentile, 75^{th} percentile)

TABLE 3. Associated factors for AKI.

Factor	Univariate Crude OR (95%CI)	P-value	Factor	Univariate Crude OR (95%CI)	P-value
Age	1.03 (1.01, 1.05)	0.001*	APACHE II score	1.29 (1.18, 1.41)	<0.001*
HT	3.91 (1.31, 13.05)	0.008*	GCS	0.64 (0.55, 0.74)	<0.001*
DM	8.42 (0.97, 392.01)	0.043*	BT	1.05 (0.67, 1.65)	0.832
Electrical Injury	0.3 (0.08, 0.92)	0.023*	MAP	0.96 (0.93, 0.99)	0.019*
Total %TBSA injury	1.04 (1.02, 1.06)	<0.001*	HR	1.03 (1.01, 1.06)	0.004*
– <20%TBSA	1 (0, 1)	0.438	RR	1.15 (1.03, 1.28)	0.011*
– 20%–40%TBSA	0.24 (0.11, 0.5)	<0.001*	FiO_2	56.26 (3.18, 995.95)	0.006*
– 41%–60%TBSA	1.33 (0.6, 2.93)	0.462	PaO_2	1 (1, 1.01)	0.123
– >60%TBSA	5.26 (2.09, 14)	<0.001*	Arterial pH	0 (0, 1.07)	0.052
Type of burn injury			Serum HCO_3	0.81 (0.74, 0.88)	<0.001*
– 2nd degree	1.02 (1.01, 1.04)	0.01*	Na	0.99 (0.96, 1.01)	0.294
– 3rd degree	1.03 (0.99, 1.08)	0.134	K	1.32 (0.8, 2.17)	0.28
Inhalation Injury	2.45 (1.13, 5.35)	0.019*	Cr	195.62 (26, 1471.65)	<0.001*
Ventilator used	11.23 (4.71, 27.65)	<0.001*	Hct	0.95 (0.92, 0.99)	0.005*
Event of hypotension in 1st 24 h (SBP<90 mmHg)	6.55 (1.93, 28.2)	0.001*	WBC	1 (1, 1)	0.083

*P-value < 0.05 **Abbreviations:** HT = essential hypertension; DM = diabetes mellitus; %TBSA = % total body surface area burn; h = hours; SBP = systolic blood pressure; GCS = Glasgow Coma Score; BT = body temperature; MAP = mean arterial pressure; HR = heart rate; RR = respiratory rate; Cr = serum creatinine; Hct = hematocrit; WBC = white blood cell

TABLE 4. Type of AKI (total AKI group = 63 patients).

RIFLE	Incidence	AKIN	Incidence	Dead in 28 days	Dead in 6 months
Risk	29 (46%)	Stage 1	29 (46%)	3 (16.7%)	6 (21.4%)
Injury	21 (33.3%)	Stage 2	21 (33.3%)	8 (44.4%)	12 (42.9%)
Failure	12 (19%)	Stage 3	13 (20.6%)	7 (38.9%)	10 (35.7%)
Loss	1 (1.59%)		Total	18	28
ESKD	0				

Abbreviations: RIFLE = Risk-Injury-Failure-Loss of Kidney Function-End-stage Kidney Disease; AKIN =Acute Kidney Injury Network; ESKD = end stage kidney disease

TABLE 5. Mortality rates for both groups.

Factors	AKI group (n=63)	Non-AKI group (n=81)	Total (n=144)	P-value
Mortality at 28 days post injury	18 (28.6%)	2 (2.5%)	20 (13.9%)	<0.001*
Mortality at 6 months post injury	28 (44.4%)	3 (3.7%)	31 (21.5%)	<0.001*

*P-value < 0.05

TABLE 6. The revised BAUX scores for each group.

Total (n=144)	AKI group (n=63)			Non-AKI group		P-value
97.01 ± 30.61	115.59 ± 27.73			82.56 ± 24.41		<0.001*
	Dead (n=28)	Survive (n=35)	P-value	Dead (n=3)	Survive (n=78)	P-value
Revised BAUX score	127.23 ± 27.72	106.27 ± 24.31	0.002*	125.33 ± 44.06	80.91 ± 22.23	0.036*

Data presented as mean ± SD, *p-value < 0.05

TABLE 7. The relationship of the revised BAUX scores and AKI with the mortality rate.

	Univariate analysis		Multivariate analysis	
	Crude OR (95%CI)	P-value	Adjusted OR (95%CI)	P-value
Revised BAUX	1.06 (1.03, 1.08)	<0.001*	1.04 (1.02, 1.06)	<0.001*
AKI	20.8 (5.93, 73.01)	<0.001*	8.69 (2.23, 33.84)	0.002*

*P-value < 0.05, CI = confidence interval

the fluid resuscitation volume required daily. However, this standard formula was often found to calculate more fluid than patients needed in practice. The current trend is to use the same formula to estimate the fluid volume, but then to adjust the fluid rate every 2 hours, based on the patient's clinical response. This technique better balances the fluid needs of the patient, thereby ensuring that there is adequate fluid resuscitation. The trend to keep a dryer status has been proven to decrease the incidence of acute complications such as compartment syndrome, both in the extremities and abdomen.[15,16]

Late complications such as infection, which is the biggest killer for late death burns, have been reported to relate to the hyper-resuscitation volume that had been given.[17] Even in the case of patients who received adequate fluid resuscitation, AKI can still happen from other pathways. For example, the direct-injury effect of pro-inflammatory cytokines acts on the stress response pathway, which stimulates the Renin-angiotensin-system (RAS); the RAS hormones then enhance the kidney's vascular tone, which boosts its glomerular filtration rate. Moreover, sometimes cytokines themselves can create a direct injury to the kidneys and the myocardial muscle; this worsens the perfusion to the kidney, which results in additional and indirect kidney damage.[13]

The stress response to burn injuries in the elderly is not the same as that for younger people.[18] Due to the elderly's poor body reserves resulting from the aging process, they are prone to develop more complications after burn injuries, such as AKI, as found in the study by Wu et al.,[19] and our study. Essential hypertension and diabetes mellitus are diseases that affect systemic vascular quality. The poor quality vessels affect end-organ perfusion of the heart and kidney. Low renal perfusion, especially in a stressed condition, creates further damage to kidneys, which results in the acute kidney injury condition.

Most patients in this series received their injuries from flame burns, thus sharing a common etiology with burn victims in other countries all around the world. However, in the present study, the AKI condition was found to be more common for the electrical-injury group than had been reported in other studies. This may be explained by the fact that this kind of injury causes more severe damage to the tissue than a flame injury, and it can develop the rhabdomyolysis condition, which burdens the kidneys and makes them prone to further injury. Pro-inflammatory cytokines play a major role in the systemic response of the body after major burn injuries. AKI occurs more frequently when patients have larger areas of burn injury. The severity of the body's systemic response to a burn injury is related to the inflammatory cytokine level, which varies with how large the injured area is.[20] Second-degree burns play a significant role in the development of AKI complications. This may be explained by the level of cytokines that are stimulated and secreted. Most of these are triggered by second-degree burns of the skin[21], which create more hemodynamic changes from fluid shifts than from third degree wounds, in which all cells are dead.[22,23]

In this study, the presence of inhalation injuries, ventilator use, episodes of hypotension in the first 24 hours, and arterial pH were related to AKI, which was also found in the study by Schneider et al.[24] The AKI group had a longer average hospital stay and more complications, consistent with other studies.[9,13,14,19,23] Moreover, the mortality in the AKI group in our study was 44.4%, which is in the range of 4%–90% from other studies.[13,14,23]

The average fluid resuscitation volume in the AKI group was larger than that for the non-AKI group, although after calculating the volume per kg per %TBSA, the difference proved to be non-significant. Currently, there is no valid, fixed formula available for calculating resuscitation fluids for all types of burn patients. The best thing that we can do is to closely monitor and titrate the fluid rate based on a patient's hemodynamic status to reach the optimum and adequate resuscitation endpoint. During the first 24 hours, the resuscitation-fluid rate for both groups was about 4 mL/kg/%TBSA, calculated using Parkland's formula; the need for fluid decreased by a half during the second 24-hour period.

The data in Table 2 shows that APACHE II is a good scoring system for evaluating the severity of a burn injury with a coexistent AKI condition. The AKI group showed significantly higher APACHE II scores than the non-AKI group ($p < 0.001$). As for the parameters of APACHE II, it was found that GCS, MAP, RR, FiO2, arterial pH, serum HCO_3, Hct and serum creatinine differed significantly between the AKI and non-AKI groups.

Most of the AKI patients were RIFLE-R and AKIN stage I, which can be treated conservatively with medication. A total of 13 patients in RIFLE-F, RIFLE-L and AKIN stage 3 received renal replacement therapy (RRT) treatment. Even though effective RRT treatment was initiated in these groups, the mortality rates were still high (38% for RIFLE-I and AKIN stage 2, 58.3% for RIFLE-L, and 53.8% for AKIN stage 3). Detection at an earlier stage may help to decrease patient morbidity from the necessary intervention treatment (RRT) and may lessen mortality.

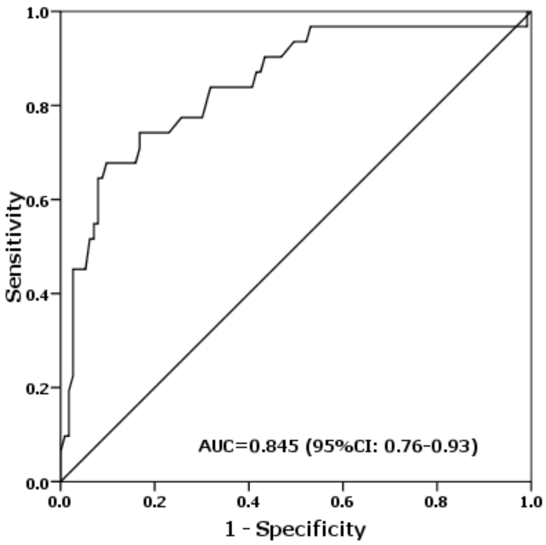
From a multivariate analysis of the revised BAUX score and AKI with the mortality rate, we found that both factors relate with mortality rate with a statistically significant adjusted OR. This means that both factors heavily affect the mortality rate. Consequently, the AKI factor should be considered in order to improve the accuracy of the calculation formula used to predict burn mortality rates.

Using the revised BAUX score cut-off at 100 for prediction of mortality in the AKI group (Osler T et al. defined a score ≥ 100 as a prediction of a 100% mortality rate[10]) as shown in Fig 1, the sensitivity is 83.9%, with 61.9% specificity. The positive predictive value is 37.7%, and the negative predictive value is 93.3%. The accuracy is 66.7%.

At 66.7%, the accuracy of the revised BAUX score to predict the mortality rate in our study was quite low compared with other studies.[24,25] The accuracy of the calculated score may have been impacted by the fact that nearly half of our study population (43.7%) were in the AKI group.

This study had added another supporting evidence that AKI is one of the important factors in predicting the outcome of the burn patients. The total number of the patients and the fact that nearly half of the population has developed AKI might be the main factor which using BAUX score in predicting mortality rate was not as accurate as shown the previous studies.

AKI is one of the significant conditions that increase the mortality rate of major burn patients. The future calculation scoring system should recognize it as an important factor affecting mortality. The revised BAUX score is not accurate enough to use to predict mortality of major burn patients with AKI.



Sensitivity	83.9%
Specificity	61.9%
PPV	37.7%
NPV	93.3%
Accuracy	66.7%

Fig 1. AUC of revised BAUX score at cut off value of 100.

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