

Futile care in Kirkuk teaching hospital burn unit.

Qutaiba Abdullah Aldoori, Aasem Mohamed Albyti, Avan Hassan Mohammed Ameen

Plastic & Reconstructive surgeon (MD)

Burn and reconstructive surgery, burn unit, Azadi teaching hospital, Kirkuk, Iraq.

burnsurg@gmail.com

ABSTRACT

Background: Futile care; a medical term applied when there is no reasonable hope of improvement or cure in spite of expense of medical or surgical care. Futile care decision governed by a variety of scoring systems to evaluate clinical situation and direct medical effort in respecting the patient requirement, surrogate allowance. Where and when the medical treatment being futile is another view must be sought for afflicted patient.

Materials & methods: This is a retrospective study about admitted patient over 7 years (since January 2012-until December 2018) were 2076 patient (total admission number) in Kirkuk teaching hospital burn unit, of them (1284 female, 762 male burns casualty) 74% of them are saved but (26%) 538 patient are dead out of total number of admission, (21%) 435 patient were with expected death, but (5%) 103 {(79 pediatric less than 12 years) and (24 patient age more than 56 years)} with un expected death the latter were succumbed to sepsis even with our best available rescue management.

Result: This study on those (21%) 435 patients (with more than 55% BSAB. & mostly associated with inhalational injury) sex variation {23 male (25-55 years), 412 female (13-45 years)} most of them self-immolation; who are falls under the known guide lines {DNR=Do Not Resuscitate} comfort care applied to them, we depend on R-Baux score to predict the probability of death after burn injury was calculated for each patient by following formula:

$(TBSA + age + [17 \times R])$. {R=1 if patient has inhalation injury and R=0 if not}.

Aim: of our study is to evaluating our working in spite of our challenges in Iraq circumstances. we used different formulae to predict mortality in burn casualties to reach best results we could approach to it.

Conclusion: our results show more increases in the mortality % than American and European studies because we have less facilities and limited resources.

Keywords: *Futile; Burn care; Baux score; Apoptosis; self-immolation.*

DOI: <http://dx.doi.org/10.32441/kjps.03.02.p11>

الرعاية الطبية غير المجدية في وحدة الحروق في مستشفى كركوك التعليمي.

قتيبة عبدالله الدوري ، عاصم محمد البياتي ، افان حسن محمد امين

وحدة جراحة الحروق والتقويم مستشفى ازادي؛ كركوك، العراق.

burnsurg@gmail.com

نبذة مختصرة:

الخلفية؛ ان الرعاية الطبية غير المجدية هي مصطلح طبي يطبق لحالة المريض الطبية عندما لا يكون هناك أمل معقول في التحسن أو العلاج على الرغم من تكلفة الرعاية الطبية أو الجراحية. وان قرار الرعاية العقيمة يحكمها مجموعة متنوعة من أنظمة التقييم لوضع المريض السريري والجهد الطبي المباشر بما يخص متطلبات المريض ، ومن ينوب عنه واوصيائه. أين؟ ومتى؟ يكون العلاج الطبي غير ذي جدوى؟ هذا هو موضوع البحث.

الطرق والمعالجة:

هذه دراسة بأثر رجعي حول المرضى الداخليين لوحدة العناية بالحرق على مدى 7 سنوات (من يناير 2012 حتى ديسمبر 2018) وكانو 2076 مريض (العدد الإجمالي للراقيدين) في وحدة الحروق بمستشفى كركوك التعليمي ، منهم (1284 أنثى ، 762 مصاب بحروق الذكور) 74٪ منهم قد تم إنقاذهم وعلاجهم ولكن (26٪) 538 مريض قد توفى ، (21٪) 435 مريض كانوا في حالة وفاة متوقعة ، لكن (5٪) 103 {79 أطفال أقل من 12 عامًا} و (24 مريض ممن يزيد أعمارهم عن 56 سنة) مع وفاة غير متوقعة ، هؤلاء المجموعة الأخيرة قد تعرضوا للإصابة بالإنتان حتى مع أفضل طرق العناية المتاحة لدينا التي قدمت لهم لغرض إنقاذهم.

النتائج :

هذه الدراسة التي أجريت على هؤلاء المرضى (21٪) 435 مريضًا (مع أكثر من 55٪ BSAB حروق الجسم. وتتصاحب في الغالب بالإصابة الاستنشاقية) الاختلاف الجنسي {23 ذكر (25-55 سنة) ، 412 أنثى (13-45 سنة)} (عدد الإناث أكثر ومعظمها حالات انتحار). الذين تكون حالاتهم أكبر من امكانيات المعالجة المتاحة لذا فانهم يندرجون تحت لائحة {DNR = لا تنعش} وتطبق عليهم العناية المريحة وتقليل الألم ، نعتمد تحديد الحالات لغرض تقييمها

وتصنيفها بمعادلة R-Baux للتنبؤ باحتمال الوفاة وذلك باحتساب إصابة الحرق لكل مريض عن طريق الصيغة التالية:

(TBSA + العمر + $[17 \times R]$). $R = 1$ } إذا كان المريض يعاني من إصابة الاستنشاقية R إن لم يكن تكون صفراً {.

الهدف من الدراسة:

هي تقييم عملنا على الرغم من التحديات التي نواجهها في ظروف العراق. لقد استخدمنا صيغ مختلفة للتنبؤ بالوفيات في إصابات الحروق للوصول إلى أفضل النتائج التي يمكن أن نفقرب منها نحو الأفضل.

الاستنتاج:

تظهر نتائجنا زيادة في نسبة الوفيات أكثر من الدراسات الأمريكية والأوروبية لأن لدينا امكانيات أقل وموارد محدودة.

الكلمات الدالة حرق ، الرعاية غير المجدية ؛ درجة بوكس ، موت الخلايا المبرمج ، الانتحار بالحرق.

1. Introduction

Futile care decision is an outcome of variable scoring indices¹ from which burn physician decide comfort care^{2,7} is the only choice that must be applied to a characteristic burn patient depending on differences in certain variables including (Age^{3,7,8}, Sex^{4,5}, BSAB %^{3,4,5}, presence of Inhalational injury^{3,4,5}, comorbidities⁸, systemic collateral damage, type of burns; flame, scald, electrical, contact, or chemical). Following massive burn trauma a synergetic burden of associated variables affects the patients' body homeostasis at the cellular level; as a result of the severe trauma which lead to severe dehydration, accompanied by cytokine storm which result in electrophysiological membrane dysfunction¹⁰, these factors disturb an effective innate immune response in GIT intestinal mucosa, lymphocytes and crypt intestinal epithelial cells can be driven to apoptosis after severe trauma⁹, Acute lung injury ; along with apoptosis of cells in the spleen and thymus are induced by remote (immunological) organ injuries^{12,13,14}, This eventually results in organ dysfunction and systemic infection¹⁵, in the burn wound both early apoptosis and delayed necrosis are present in the zone of ischemia⁶ (figure 1) contributing to injury progression.

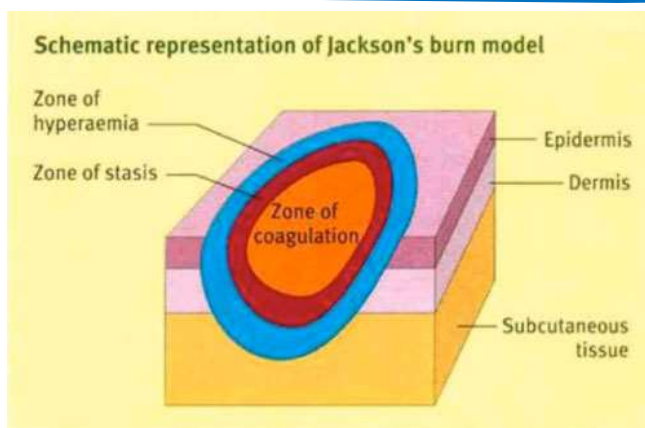


Fig. 1

2 . Materials & methods;

In Kirkuk city, Azadi teaching hospital burn unit which is the central part of referral burn casualties in Kirkuk region and surrounding governorates (Tikret & Dyala), the burns are very aggressive painful event in the life of patient, and his family surrogate on various level (physical ,psychological, and financial issues). In this retrospective study ; over 7 years 2076 patient (total admission number) in Kirkuk teaching hospital burn unit, of them (1284 female, 762 male burns casualty) 74% of them are saved and managed either conservatively or surgically with early excision and prompt skin grafting, but (26%) 538 patient are dead out of total number of admission, *The exclusion criteria* from our study is those who comprise (5%) 103 {(79 pediatric less than 12 years) and (24 patient age more than 56 years)} with un expected death they were succumbed to sepsis even with our best available rescue management and they died unfortunately.

3. Result;

(21%) 435 patient were with expected death; whom at the time of admission are evaluated according to R-Baux scoring to predict probability of death and it shows mostly more than 120 % -150 % death probability, sex variation{**23** male (25-55years) suicidal attempt, and **412** female (13-45years)}most of them self-immolation; who are falls under the known guide lines {DNR=Do Not Resuscitate} comfort care applied to them, we depend on R-Baux score to predict the probability of death after burn injury was calculated for each patient by following formula:(TBSA + age + [17×R]). {R=1 if patient has inhalation injury and R=0 if not}.

4. Discussion;

Jackson's pathophysiologic description of the burn wound into three zones of injury: The Zone of coagulation; surrounded by the Zone of stasis, and the zone of hyperemia⁶. Approximately half of the cells in the zone of stasis undergo apoptosis or necrosis as a result of oxidative stress, ongoing inflammation, and decreased blood flow due to micro thrombosis¹⁶, so the programmed cell death are initiated since early minutes following the burn event, any delay in rescuing the burnt patient increasing the chance of bad progression. On the other hand patient who attempt suicide usually choosing a place where no one know about his trial; the self-immolation patient by burns usually associated with severe inhalational injury because in all our study we smell the gasoline odor or they give history of using highly inflammable substance and being isolated from their families; usually in a closed spaces.

Another important factor is the duration of burning; because time factor in contact with flame lead to more increase in the depth of burn ; the explanation behind that is the internal conflicts and the severe psychological pain that will not be erased until the new external skin pain attracting her\his conflicts to be then after seconds to minutes since ignition with full thickness injuries.

Another issue is the delay until attending primary care and secondary care emergency rescue place to receive the efficient care ABCD measures. The earliest admission with a good opportunity to be saved but more delay associated with more probability of death.

This study on those (21%) 435 patients (table 1);(with more than 55% BSAB. & mostly associated with inhalational injury) sex variation{23 male (25-55 years) most of the male patients with deep psychological problems they feel unregretted, and they insisting for going to death. On contrast 412 female (13-45years)} most of them self-immolation; they are mostly regretted, they are concerning of their life; cooperative to be helped, always seeking to be saved; in spite of her severe condition. We have to evaluate each patient specifically because the variety of variables (age, sex, surface area burned, inhalational injury, comorbidity, resuscitation sufficiency are being in some patient and absent in other.

Those who are falls under the known guide lines {DNR=Do Not Resuscitate} comfort care applied to them; we depend on R-Baux score to predict the probability of death after burn injury it was calculated for each patient by following formula:

(TBSA + age + [17×R]). {R=1 if patient has inhalation injury and R=0 if not}.

Futile care patient	No.	Presence of inhalational injury	Age limits	Scoring system for evaluation	Probability of death
male	23	Inh.injury +ve	25-55 years	Baux score	120-140%
female	412	Inh.injury +ve	13-45 years	Baux score	110 -160%
Total palliative care (7 years)	435				

Table 1

Comparison other hospital (table 2)

City burn center	Chelsea and Westminster Hospital ¹⁸ UK	Prelada Hospital ¹⁹ Portugal	Uttar Pradesh, ²⁰ India.	Royal North Shore Hospital ¹⁷ (RNSH). <u>Australia</u>
Time of study	January 2004 to July 2013	January 2011 and December 2014	August 2010 and July 2013	2006-2017
Number of sample	5246 patient	233 patients	108 patients,	3002
R-Baux scoring Futile	115%	120%	110%	107%

(table 2)

Our limitation in surgical intervention is the old fashions equipment's dermatomes surgical machines in the operative room some important dressing tools like the skin substitutes or integra which is very important in management of extensive wounds more than 50% BSAB full thickness wounds that needs to be covered promptly.

Many scoring for burn but we use The Baux Score; which is continue to provide a simple logical Ratio of the Risk of mortality & Survival after major burn injury;

AGE + BSAB% (+/0 Inh. Inj. 17)

It is increasingly common, and it can be giving decisions by un specialist about initial triage, management planning.

5. Conclusion;

The good understanding of the burn pathophysiology and the sequences the wound pass on time factor ; is so important because the cell death in burn patient occur in two parallel way the direct destructed cells and the progressive sequential way (apoptosis); the two are meet at death of the human body, the planning whether to give the patient a trial of resuscitation with active intervention is an option given to a patient when his condition met with resources with available equipment's (skin substitutes and skin culture lab and cadaveric skin banking) so the opportunity to save patients with a higher percentage burns but if working in very limited resources the limitation decrease the percentage of burn that can be saved exponentially.

6. Aim of study;

The evaluation of our working and comparison with developed countries burn centers will put the path way of development and success to reach better results.

7. Recommendation;

We have to make a team work to put the plan how to reach best ways to upgrade our management of burns in our hospital.

8. References;

- 1] M.B. Zollo, J.C. Moskop, and C.E. Kahn Jr., "Knowing the Score: Using Predictive Scoring Systems in Clinical Practice," *American Journal of Critical Care* 5 (1996): 147-150.
- 2] David F. Kelly, *Medical Care at the End of Life: A Catholic Perspective* (Washington, DC: Georgetown University Press, 2006), 42-44.
- 3] Osler T, Glance LG, Hosmer DW. Simplified estimates of the probability of death after burn injuries: extending and updating the Baux score. *J Trauma*. 2010;68:690–697 [PubMed](#)
- 4] Tobiasen J, Hiebert JH, Edlich RF. Prediction of burn mortality. *Surg Gynecol Obstet*. 1982;154:711–711 [PubMed](#)
- 5] Gomez M, Wong DT, Stewart TE, Redelmeier DA, Fish JS. The FLAMES score accurately predicts mortality risk in burn patients. *J Trauma*. 2008;65(3):636–45.
- 6] Jackson DM. The treatment of burns: an exercise in emergency surgery. *Ann R Coll Surg Engl*. 1953; 13:236–57.

- 7] Iain Harris and Scott A. Murray, "Can Palliative Care Reduce Futile Treatment? A Systematic Review," *British Medical Journal of Supportive and Palliative Care* 3 (2013): 389-394.
- 8] Gerstein AD, Phillips TJ, Rogers GS, Gilchrest BA: Wound healing and aging. *Dermatol Clin*, 11(4): 749-57, 1993.
- 9] Hotchkiss RS, et al. Rapid onset of intestinal epithelial and lymphocyte apoptotic cell death in patients with trauma and shock. *Crit Care Med*. 2000; 28:3207–3217. [PubMed: 11008984]
- 10] Chen W, et al. Cytokine cascades induced by mechanical trauma injury alter voltage-gated sodium channel activity in intact cortical neurons. *J Neuroinflammation*. 2017; 14:73. [PubMed: 28359334]
- 11] Pfeifer R, Heussen N, Michalewicz E, Hilgers RD, Pape HC. Incidence of adult respiratory distress syndrome in trauma patients: a systematic review and meta-analysis over a period of three decades. *J Trauma Acute Care Surg*. 2017; 83:496–506. [PubMed: 28590348]
- 12] Levy G, et al. Parasympathetic stimulation via the vagus nerve prevents systemic organ dysfunction by abrogating gut injury and lymph toxicity in trauma and hemorrhagic shock. *Shock*. 2013; 39:39–44. [PubMed: 23247120]
- 13] Lee MA, Yatani A, Sambol JT, Deitch EA. Role of gut-lymph factors in the induction of burn-induced and trauma-shock-induced acute heart failure. *Int J Clin Exp Med*. 2008; 1:171–180. [PubMed: 19079671]
- 14] Tiesi G, et al. Early trauma-hemorrhage-induced splenic and thymic apoptosis is gut-mediated and toll-like receptor 4-dependent. *Shock*. 2013; 39:507–513. [PubMed: 23542401]
- 15] Sordi R, et al. Artesunate protects against the organ injury and dysfunction induced by severe hemorrhage and resuscitation. *Ann Surg*. 2017; 265:408–417. [PubMed: 28059970]
- 16] Shupp JW, Nasabzadeh TJ, Rosenthal DS, et al. A review of the local pathophysiologic bases of burn wound progression. *J Burn Care Res*. 2010;31(6):849-873.
- 17] Heng et al. (2015). Revised Baux Score and updated Charlson comorbidity index are independently associated with mortality in burns intensive care patients. *Burns*. 41(7):1420-7.
- 18] Sheppard NN, Hemington-Gorse S, Shelley OP, Philp B, Dziewulski P. Prognostic scoring systems in burns: a review. *Burns* 2011;37(8):1288–95.
- 19] Wearn C et al.: Outcomes of burns in the elderly: revised estimates from the Birmingham Burn Centre. *Burns*, 41(6): 1161-8, 2015.
- 20] Thombs BD, Singh VA, Halonen J, Diallo A, Milner SM. The effects of preexisting medical comorbidities on mortality and length of hospital stay in acute burn injury: Evidence from a national sample of 31,338 adult patients. *Ann Surg* 2007;245:629-34.