Can Time to Treatment Reduce in Hospital Mortality and Morbidity among Surgical and Nonsurgical Elderly Patients with Sepsis

T Wasfie, A Buzadzhi, M Naisan, B Senger, S Memar, A Tangalos, J Hella, S Hood, K Barber

Background:

While Sepsis mortality remains high (about 30%), efforts to reduce it by implementing various measures are continuing. The recent CDC guidelines are promising. We collected data from our Sepsis patients presented to the Emergency Department(ED) with sepsis and looked at their mortality and morbidity after being treated with the new protocol and compared it to earlier consecutive patients with sepsis before implementation of the protocol.

Methods:

A retrospective analysis of 1079 patients seen in the ED with sepsis during 2018 and 2020, before and after implementation of the new CDC protocol.The data collected included age, gender, race, length of stay, comorbid conditions, mortality, and therapy received. Statistical analysis using Student's t-test and Chi square test as well as Cox regression analysis to determine the confounding factors that may influence survival. The patients were divided into two groups: pre protocol (group 1) and post protocol (group 2).

	Group 1 (n=551) Pre Protocol	Group 2 (n=528) Post Protocol	p-value
Age (mean ± SD)	65 ± 16.90	64 ± 16.83	0.35
Gender: [n (%)] Male Female	 220 (49) 281 (51)	 256 (49) 271 (51)	0.88
Race: [n (%)] Caucasian Other	 476 (86) 75 (14)	 445 (84) 83 (16)	0.33
Hospital LOS* (mean ± SD)	9 ± 6.44	9 ± 6.67	0.92
ICU** LOS (mean ± SD)	1.80 ± 3.24	2.2 ± 4.1	0.92
Comorbid conditions [n (%)]			
Cardiovascular Disease	334 (61)	335 (63)	0.33
Chronic Obstructive Pulmonary Disease	216 (39)	214 (41)	0.65
Diabetes Mellitus	228 (41)	218 (41)	0.97
Chronic Kidney Diseases	192 (35)	191 (36)	0.64
Mortality	68 (12.3)	48 (9)	0.085
Medical Mortality	13%	9%	
Medical Morbidity	55%	51%	
Surgical Mortality	10%	9%	
Surgical Morbidity	50%	55%	

Table 1: Variables between Group 1 (pre protocol) and Group 2 (post protocol)
*LOS= length of stay in days, **ICU= Intensive Care Unit

Results:

A total of 1079 patients were included in the study. The mean age was 65 ± 16.86 years, divided equally between gender (male 49%, female 51%).Mean hospital length of stay were similar in both groups (9 days), however mortality in group 1 (pre protocol) were 12.3% vs 9.1% (p=0.08) in group 2 (post protocol), however patients with coronary artery diseases, chronic obstructive pulmonary diseases, as well as chronic kidney diseases all showed statistically significant survival rate in the protocol group. The mortality rate of surgical patients was improved by 1% and of the medical patients by 4%.

Conclusion:

The current protocol for sepsis when implemented will improve patients survival, in both surgical and medical patients and significantly in those with comorbid conditions.

References:

1. Arina P, Singer M. Pathophysiology of sepsis. *Curr Opin Anaesthesiol*. 2021;34(2):77-84. doi: 10.1097/ACO.0000000000000963.
2. Fleischmann-Struzek C, Mellhammar L, Rose N, et al. Incidence and mortality of hospital- and ICU-treated sepsis: results from an updated and expanded systematic review and meta-analysis. *Intensive Care Med*. 2020;46(8):1552-1562. doi: 10.1007/s00134-020-06151-x.
3. Wasfie T, Buzadzhi A, Naisan M, et al. Effect of implementation of an early treatment of sepsis protocol on surgical outcomes. *Am Surg*. 2022;88(9):2227-2229. doi: 10.1177/00031348221091971.
4. Weinberger J, Rhee C, Klompas M. A critical analysis of the literature on time-to-antibiotics in suspected sepsis. *J Infect Dis*. 2020;222(Suppl 2):S110-S118. doi: 10.1093/infdis/jiaa146.