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The Impact of Age on Severe Sepsis and Septic Shock Survivors Outcomes and Performance Status one Year after Hospital Discharge

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Introduction

- Sepsis remains a major challenge in the critically ill patients especially in the elderly who need more focus (Kelly A et al. 2004). Older patients have a higher chance to develop sepsis and at increased risk of death due to sepsis (Angus DC et al. 2001; Martin GS et al. 2006). The study of Williams Teresa A. et al. 2008; showed that, age, comorbidities, and primary diagnosis have the strongest association with long-term survival, and showed that comorbidities were of particular importance as it may be amenable to modification.

Introduction Cont.

- Additional studies are needed to investigate such important issues as long term post-hospital discharge; survival and health related quality of life in different age groups after severe sepsis and septic shock (Timothy D et al. 2005). Also, it is important to consider other criteria other than just chronological age, such as pre-sepsis performance status and comorbidities (Luis A. et al. 2002).

Study Objective

- The objective of the current study was to evaluate the impact of age on severe sepsis & septic shock survivors outcomes (mortality and survival) and performance status at one year after hospital discharge in different age groups and to know their characteristics, survival time and prognostic factors.

Methods & Settings

- This is a retrospective cross-sectional study of consecutive adult patients (≥18 years) who were admitted with severe sepsis and septic shock between April 2007 and March 2010 for ≥ 24 hours to the medical-surgical and trauma intensive care unit. Only those patients who were alive at the time of hospital discharge we included. For patients with more than one ICU admission within the same hospitalization, only first ICU admission was counted. We evaluated the vital and performance status pre-sepsis, during ICU stay and one year after hospital discharge. Data was obtained from an electronic ICU database, medical records and hospital information system. Additionally, we conducted telephonic interviews to evaluate vital status and performance at one year of hospital discharge using "*KARNOFSKY PERFORMANCE STATUS SCALE*". Patients were classified into three groups ≤ 44, 45 - 64 and ≥ 65 years old (elderly) respectively.

Methods & Settings cont.

- **Exclusion Criteria:** Patients admitted to the ICU who had cardiac arrest before ICU admission were excluded.
- **Sample size** was (n)195.
- Data obtained were analyzed by using **PASW** Statistics, version 18.0 (SPSS, Chicago, IL, USA) software.

Results

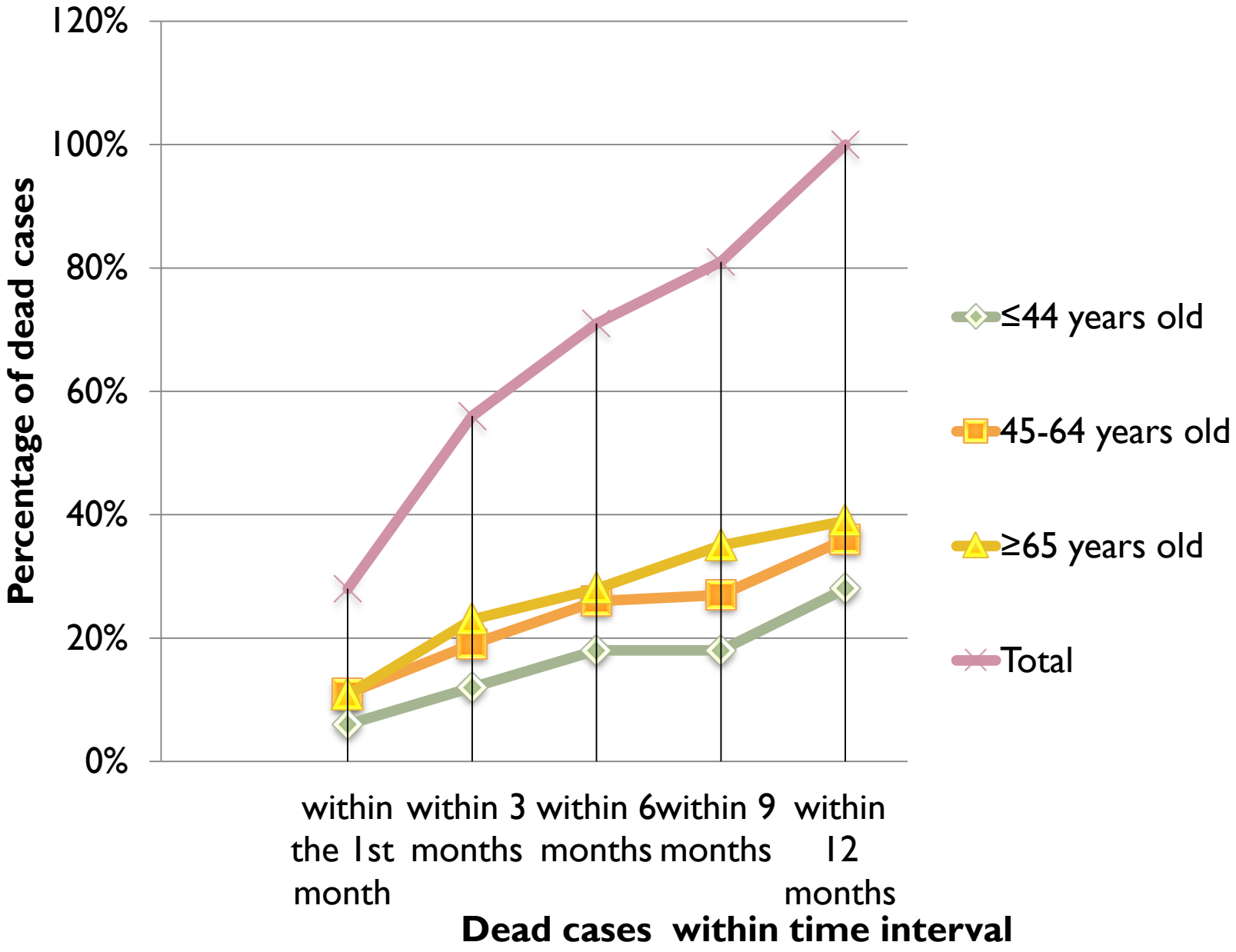
- There were 195 sepsis, severe sepsis and septic shock survivors included in the study analysis with mean age 57±20.2 years. Septic shock cases contributed 66%, while 17% for sepsis and severe sepsis each.
- The overall mortality rate was 35%. While 65% still survive at one year post hospital discharge, one-third (31%) of them suffer from significant impairment of performance status and only one third (34%) of those patients is able to carry on normal activity and to work.

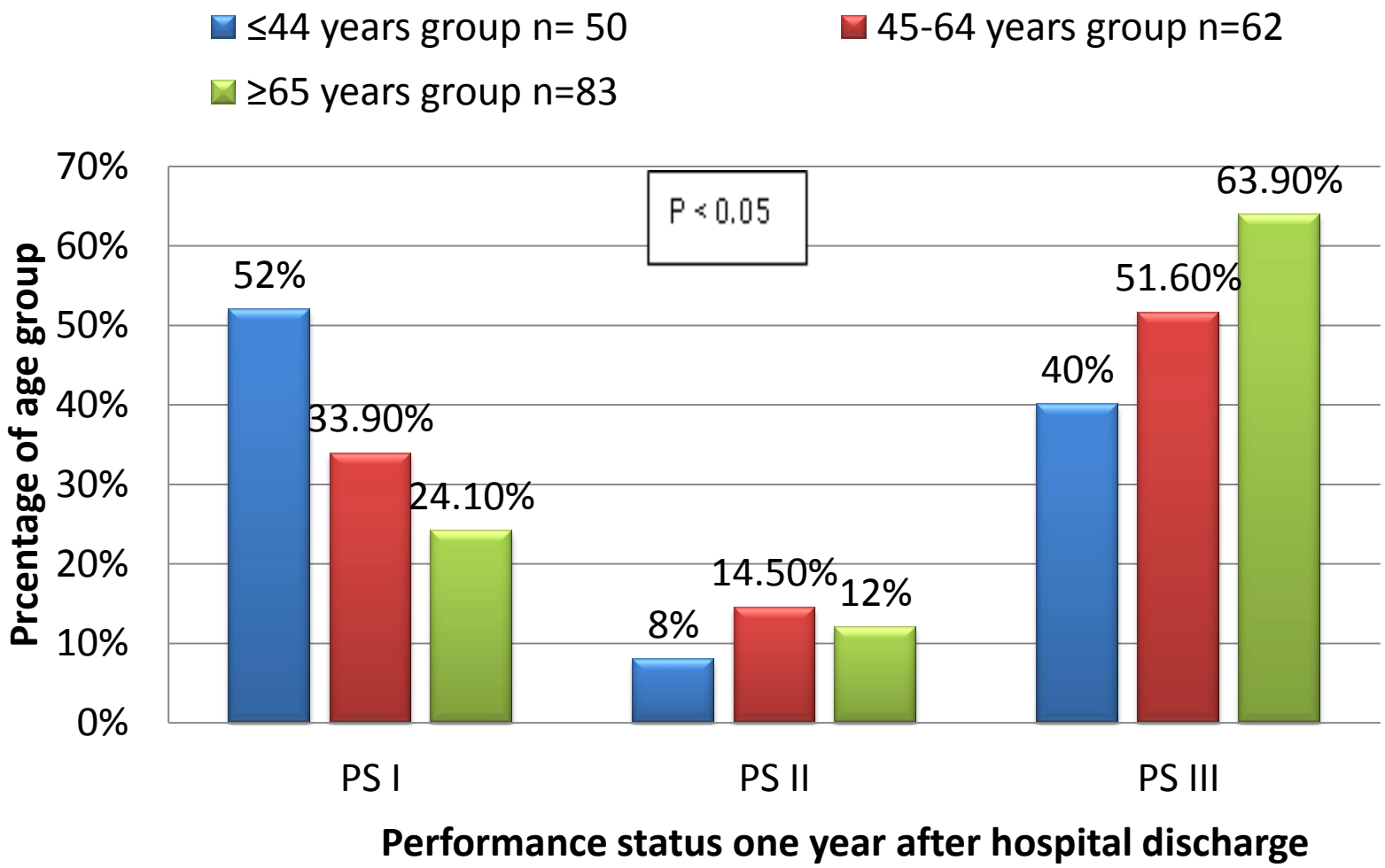
Table 1 Characteristics of patients with severe sepsis and septic shock survivors

Variables	≤44 years n=50	45-64 years n=62	≥65 years n=83	P value
Sex:				
•Male	26 (52%)	29 (46.8%)	48 (57.8%)	0.415
•Female	24 (48%)	33 (53.2%)	35 (42.2%)	
Co- morbid disease				
•HTN	7 (14%)	34 (54.8%)	72 (86.7%)	<0.0001
•DM	6 (6.1%)	29 (46.8%)	63 (75.9%)	<0.0001
•CVA	0	4 (6.5%)	21 (25.3%)	<0.0001
•IHD	1 (2%)	6 (9.7%)	17 (20.5%)	0.005
•CHF	0	4 (6.5%)	10 (12%)	0.032
•CRF	5 (11.1%)	19 (30.6%)	21 (25.3%)	0.029
•AF	0	0	8 (9.6%)	0.004
ALI/ARDS				0.038
•≤ 300 mm Hg	12 (25%)	12 (19.7%)	28 (34.1%)	
•≤ 200 mm Hg	18(37.5%)	37 (60.7%)	34 (41.5%)	
Performance status pre-sepsis				
•PS I	42 (84%)	45 (72.6%)	37 (44.6%)	<0.0001
•PS II	3 (6%)	11 (17.7%)	24 (28.9%)	
•PS III	5 (10%)	6 (9.7%)	22 (26.5%)	
Number of organ failure (≥ 3 organs)	5/50 (10%)	22/62(35.5%)	24/83(28.9%)	0.049
APACHE II (mean ±SD)	(20.5±6.2)	(24.6±6)	(26.2±6.5)	<0.0001
APACHE III (mean ±SD)	(66.1±24.4)	(81.5±23.3)	(85.8±27.4)	<0.0001

Mortality

- The mortality rate was proportionally increasing with time intervals, and especially in the first 3 to 6 months post hospital discharge. More than Half (56%) of the dead case died within the first three months after hospital discharge, 51% of them ≥65 years.
- If **performance status pre-sepsis** of severe sepsis and septic shock survivors was **able to carry on normal activity** and to work, they **would be more able to survive** one year after hospital discharge especially in elderly (≥65 years) patients ($P<0.00001$).


120%
100%
80%
60%
40%
20%
0%
Percentage of dead cases
within the 1st month
within 3 months
within 6 months
within 9 months
within 12 months
Dead cases within time interval
≤44 years old
45-64 years old
≥65 years old
Total



Abbreviations : ***PS I*** able to carry on normal activity and to work; no special care needed; ***PS II*** unable to work; able to live at home and care for most personal needs; varying amount of assistance needed; ***PS III*** unable to care for self; requires equivalent of institutional or hospital care; disease may be progressing rapidly.

Performance Status

- The performance status on long term decrease as the age increases ($P<0.05$). At one year after hospital discharge, the highest percentage of patients who had better performance status (able to carry on normal activity and to work) were ≤44 years.
- If **performance status pre-sepsis** of severe sepsis and septic shock survivors was able to carry on normal activity and to work, **they would be more able to had better performance status**

Survival Analysis

- The overall mean of estimated survival time at one year post hospital discharge was 9.3 months, the estimated survival time significantly ($P<0.0001$) decrease as the performance pre-sepsis decline,
- The adjusted Hazards Ratio (Adj. HR) shows that, the patients who had poor pre-sepsis performance status (***PS II*** and ***PS III***) , they had **more than three times higher risk to die** as compared to who had better (***PS I***) pre-sepsis performance status.

Prognostic Factors

- our result showed that, Congestive Heart Failure in addition to pre-sepsis performance status was one of the independent prognostic factors for poor hospital outcomes and performance status after hospital discharge in severe sepsis and septic shock survivors.

Limitations of the Study

- It is a single center study, in order to avoid the bias and conflict in documentations between the centers also to avoid the different ways in documentations. On the other hand this center has an electronic ICU data base plus the hospital information system with full documentations and medical records.
- Also, it is on Saudi populations only.

Conclusion

- The mortality and declining in performance status continued to increase after hospital discharge, more rapid and sharper within the first three to six months after hospital discharge especially in the elderly group (≥ 65 years). Pre-sepsis performance status and Congestive Heart Failure were the independent prognostic factors for poor outcomes and performance status in severe sepsis and septic shock survivors. This data highlights that older patients with poor pre-sepsis performance status and congestive heart failure need more care and follow up than younger.

Thank you