

Clinical characteristics and outcomes in very elderly patients with prolonged acute mechanical vent

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Background/Aims: The present study evaluated clinical characteristics and outcomes in very elderly (≥ 80 years of age) patients with prolonged acute mechanical ventilation (≥ 96 hours of ventilator care), who were admitted in a medical intensive care unit (ICU) of a regional university-affiliated tertiary care hospital. **Methods:** Data were obtained from 576 patients over 9 years (from March 2008 to February 2017), respectively. Patients were divided into < 65 (young, $n=217$), 65-79 (elderly, $n=278$), and ≥ 80 (very elderly, $n=81$) years of age. Clinical characteristics and outcomes of very elderly patients were compared with younger age groups. Also prognostic indicator for predicting hospital mortality was investigated in these patients. **Results:** In very elderly patients, Charlson's comorbidity index (6.9 ± 3.8 vs 2.3 ± 1.8 , $p < 0.001$) and Acute Physiology and Chronic Health Evaluation II score on the day of ICU admission (21.7 ± 7.8 vs 19.2 ± 7.7 , $p = 0.003$) had significantly higher than those with young age group. They also significantly higher rate of Do-Not-Resuscitation (DNR) order (medical decisions about withholding or withdrawing life-sustaining treatment) during ICU stay (35.8% for very elderly vs 23.0% for elderly vs 18.9% for young, $p = 0.009$) and hospital mortality (56.8% vs 41.4% vs 39.2%, $p = 0.019$) compared with other groups. In very elderly patients, however, total medical cost (mean 26,969 vs 34,545 USD, $p = 0.039$) and performance rate of tracheostomy during hospital stay (37.0% vs 50.4%, $p = 0.035$) were significantly lower than young and elderly age group, respectively. In multivariate analysis, DNR order was significantly related to hospital mortality in very elderly patients (Odds ratio 7.688, 95% Confidence Interval 2.228-26.520, $p = 0.001$). **Conclusions:** In our study, very elderly patients had higher comorbidities before admission, severity-of-disease on ICU admission, and hospital mortality compared to those of their younger counterpart. However, they had lower medical cost and performance rate of tracheostomy during hospital stay. Also, DNR order was significant prognostic indicator for predicting hospital mortality based on multivariate logistic regression analysis.

Table 1. Comparison of clinical characteristics and outcomes among three age groups (< 65 , 65-79 and, ≥ 80 years of age) *

	Total (n=576)	Age < 65 years (n=217)	Age 65-79 years (n=278)	Age ≥ 80 years (n=81)
n	576	217	278	81
Male, n (%)	395 (68.6)	158 (72.8)	197 (70.9)	52 (64.3)
Body mass index (kg/m ²)	23.8 ± 4.0	23.8 ± 4.0	23.1 ± 3.8	23.8 ± 3.9
ICU length of stay (day)	28.3 ± 11.5	30.0 ± 9.6	27.8 ± 9.7	25.8 ± 11.3
Hospital mortality, n (%)	332 (57.6)	133 (61.3)	141 (50.7)	58 (71.4)
Total medical cost during hospital stay (USD)	30,571 ± 21,014	34,545 ± 20,742	28,858 ± 19,226	26,969 ± 18,127
Charlson's comorbidity index *	3.2 ± 3.2	2.3 ± 1.8	3.5 ± 3.8	6.9 ± 3.8
APACHE II score [†]	20.5 ± 7.6	19.2 ± 7.7	21.7 ± 7.8	21.7 ± 7.8
SOFA score [‡]	7.1 ± 3.0	7.5 ± 3.0	7.2 ± 3.0	7.2 ± 3.1
The most common cause leading to MV : pulmonary disease	180 (31.3)	150 (69.1)	20 (7.2)	71 (87.7)
Cardiothoracic surgery (CTI) status (No)	250 (43.4)	80 (37.0)	140 (50.4)	30 (37.0)
DNR order during ICU stay [§]	134 (23.3)	41 (18.9)	64 (23.0)	29 (35.8)
Hospital mortality, n (%)	332 (57.6)	133 (61.3)	141 (50.7)	58 (71.4)

* Values presented as mean ± SD for continuous variables and number (%) for categorical variables.
[†] Values presented as mean ± SD for continuous variables and number (%) for categorical variables.
[‡] Values presented as mean ± SD for continuous variables and number (%) for categorical variables.
[§] Values presented as mean ± SD for continuous variables and number (%) for categorical variables.
 † Data from 548 patients.
 ‡ Data from 445 patients.
[§] All clinical data was calculated from medical records on the day of ICU admission.
 * Denotes all medical decisions about withholding or withdrawing life-sustaining treatment.
 † ICU: intensive care unit, APACHE: Acute Physiology and Chronic Health Evaluation, SOFA: Sequential Organ Failure Assessment, MV: Mechanical ventilation, DNR: Do Not Resuscitate.

Table 2. Comparison of clinical characteristics between survivors and nonsurvivors in very elderly patients *

	Hospital survivors	Hospital nonsurvivors	p value
n	46 (56.4)	35 (43.6)	
Male, n (%)	27 (58.3)	22 (60.0)	0.330
Body mass index (kg/m ²)	22.1 ± 3.6	21.6 ± 3.6	0.595
ICU length of stay (day)	38.6 ± 10.5	22.4 ± 10.5	0.016
Hospital length of stay (day)	64.1 ± 17.1	28.4 ± 10.8	0.004
Total medical cost during hospital stay (USD)	31,811 ± 18,890	30,590 ± 22,242	0.046
Charlson's comorbidity index *	7.1 ± 4.0	6.7 ± 3.6	0.035
APACHE II score [†]	19.1 ± 6.6	21.7 ± 7.8	0.008
SOFA score [‡]	5.9 ± 3.0	8.2 ± 3.6	0.013
The most common cause leading to MV : pulmonary disease	31 (67.4)	40 (87.0)	< 0.001
Cardiothoracic surgery (CTI) status (No)	14 (30.4)	18 (44.7)	0.603
DNR order during ICU stay [§]	5 (10.9)	24 (57.2)	< 0.001

* Values presented as mean ± SD for continuous variables and number (%) for categorical variables.
[†] Data from 76 patients.
[‡] Data from 65 patients.
[§] All clinical data was calculated from medical records on the day of ICU admission.
 * Denotes all medical decisions about withholding or withdrawing life-sustaining treatment.
 † ICU: intensive care unit, APACHE: Acute Physiology and Chronic Health Evaluation, SOFA: Sequential Organ Failure Assessment, MV: Mechanical ventilation, DNR: Do Not Resuscitate.

Table 3. Multivariate logistic regression analysis of factors associated with hospital mortality in very elderly patients *

	OR (95% CI)	p value
APACHE II score [†]	0.887 (0.787-1.003)	0.061
SOFA score [‡]	1.122 (0.884-0.913)	0.343
DNR order [§]	7.688 (2.228-26.520)	0.001

* All clinical data was calculated from medical records on the day of ICU admission.
[†] Adjusted all medical decisions about withholding or withdrawing life-sustaining treatment.
 † OR: Odds Ratio, ‡ Confidence Interval.
 ‡ APACHE: Acute Physiology and Chronic Health Evaluation, SOFA: Sequential Organ Failure Assessment, DNR: Do Not Resuscitate.

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