

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

부산대학교병원 내과

*류완호, 강예원, 이광하

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).

	Age < 65 years (n=217)	Age 65-79 years (n=278)	Age ≥ 80 years (n=81)
Male, n (%)	99 (45.6%)	158 (56.8%)	52 (64.2%)
Age	64.1 \pm 14.1	71.0 \pm 12.5	80.5 \pm 5.4
Body mass index (kg/m ²)	21.8 \pm 4.0	21.5 \pm 4.4	21.3 \pm 3.5
ICU length of stay (day)	28.3 \pm 11.5	30.0 \pm 15.6	27.8 \pm 10.7
Hospital mortality, n (%)	67 (30.9%)	115 (41.4%)	41 (50.6%)
Total medical cost during hospital stay (USD)	30,571 \pm 21,011	34,545 \pm 29,373	26,969 \pm 18,127

Charlson's comorbidity index	3.2 \pm 3.2	7.3 \pm 3.8	9.5 \pm 3.8
APACHE II score	20.5 \pm 7.4	21.2 \pm 7.8	21.7 \pm 8.4
SOCRA score	7.1 \pm 3.0	7.5 \pm 3.6	7.2 \pm 3.1
The most common cause leading to MV	180 (82.9%)	247 (88.8%)	71 (87.7%)
Tracheostomy during ICU stay (%)	29% (13.4%)	80 (28.8%)	10 (12.4%)
DNR order during ICU stay	134 (61.7%)	41 (14.7%)	15 (18.6%)
Hospital mortality, n (%)	38 (17.5%)	85 (30.6%)	40 (49.4%)

Values presented as mean \pm SD for continuous variables and number (%) for categorical variables.

*Values presented as superscript # have significantly higher outcomes to other values (p < 0.05).

1. Data from 549 patients.

2. Data from 445 patients.

3. All clinical data was calculated from medical records on the day of ICU admission.

4. Defined as medical decision about withholding or withdrawing life-sustaining treatment.

ICU: intensive care unit, APACHE: Acute Physiology and Chronic Health Evaluation, SOCRA: Sequential Organ Failure Assessment, MV: Mechanical ventilation, DNR: Do Not Resuscitate.

Table 2. Comparison of clinical characteristics between survivors and non-survivors in very elderly patients.

	Hospital survivors	Hospital non-survivors	p-value
Male, n (%)	46 (56.3%)	37 (45.6%)	0.302
Body mass index (kg/m ²)	20.7 \pm 3.8	21.8 \pm 4.4	0.598
ICU length of stay (day)	28.6 \pm 10.5	27.4 \pm 10.8	0.542
Hospital mortality, n (%)	64 (79.4%)	78 (96.4%)	0.004
Total medical cost during hospital stay (USD)	21,811 \pm 11,892	36,500 \pm 22,482	0.048
Charlson's comorbidity index	7.1 \pm 3.6	6.7 \pm 3.6	0.835
APACHE II score	19.1 \pm 4.4	24.7 \pm 8.4	0.002
SOCRA score	5.9 \pm 3.0	4.2 \pm 3.6	0.283
The most common cause leading to MV: pulmonary disease	31 (38.3%)	40 (49.4%)	< 0.001
Tracheostomy during ICU stay (%)	14 (17.5%)	18 (22.5%)	0.603
DNR order during ICU stay	5 (6.2%)	24 (29.8%)	< 0.001

1. Data from 76 patients.

2. Data from 63 patients.

3. All clinical data was calculated from medical records on the day of ICU admission.

4. Defined as medical decision about withholding or withdrawing life-sustaining treatment.

ICU: intensive care unit, APACHE: Acute Physiology and Chronic Health Evaluation, SOCRA: 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	0.987 (0.785-1.239)	0.941
SOCRA score	1.122 (0.845-1.512)	0.343
DNR order	7.688 (2.228-26.520)	0.001

1. All clinical data was calculated from medical records on the day of ICU admission.

2. Defined as medical decision about withholding or withdrawing life-sustaining treatment.

OR: Odds Ratio, CI: Confidence Interval.

APACHE: Acute Physiology and Chronic Health Evaluation, SOCRA: Sequential Organ Failure Assessment, DNR: Do Not Resuscitate.