SALA VIOLANTE/GINEVRA

URGENZE RESPIRATORIE

Moderatori: **Salvatore Maggiore – Giorgio Carbone**

Paolo Groff

La ventilazione nell'old-old e nell'oldest-old

XII congresso nazionale
simeu
RICCIONE 13-15 MAGGIO 2022

La Ventilazione nell'old-old e nell'oldest old

Paolo Groff

XII congresso nazionale
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RICCIONE 13-15 MAGGIO 2022

Perché ne parliamo

- Il segmento della popolazione >85 è quello che ha avuto il massimo sviluppo nell'ultimo secolo
- L'età correla con lo sviluppo di malattie croniche (respiratorie) e con un'aumentata sensibilità agli eventi acuti
- Un numero crescente di «anziani» riceve procedure di critical care e l'elevata mortalità in TI è un fatto consolidato
- La NIV potrebbe costituire un giusto bilanciamento tra intensità, aspettativa di vita, qualità della vita ma un aumento delle treatment failures potrebbe tradursi in aumentata mortalità

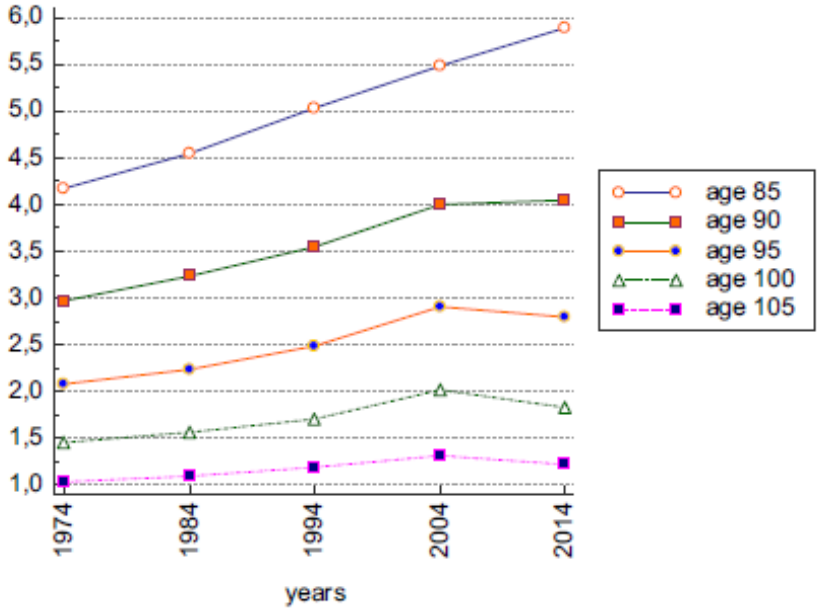
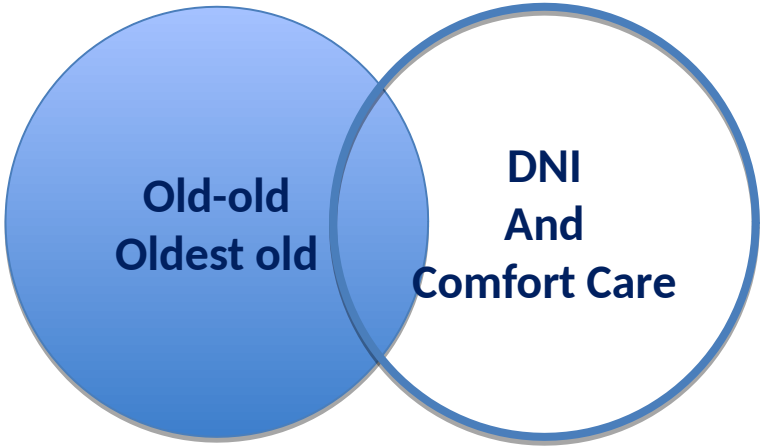


Fig. 1 Life expectancy Italian oldest old 1974–2014

Oldest old vs. DNI vs. Comfort Care



End stage chronic respiratory failure, at least two criteria among: O2 or NIV home treatment; previous ICU admission for ARF within the past year; FEV1 < 30% pred; cor pulmonale (National Hospice Organization Guidelines, 1999)

Intubations in elderly patients have decreased from 1999 through 2014– Results of a multi-center cohort study

Timothy Johnson, MD [a,c,*], Peter Richman, MD, MBA [b], John R. Allegra, MD, PhD [a,c], Barnet Eskin, MD, PhD [a,c], James Seger, DO [d]

American Journal of Emergency Medicine 36 (2018) 1964–1966

1.065371 pts >65 yo (mean 81). 6297 ETI from 1999 to 2014

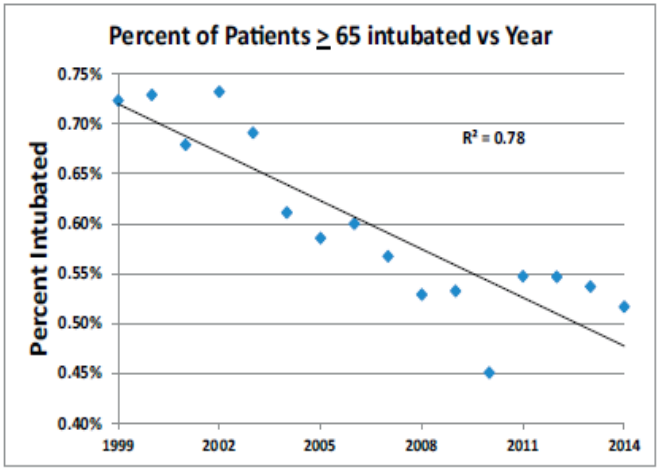


Table 1
Change in percent of patients ≥65 years intubated by diagnoses.

Diagnosis	1999*	2014^	% change	95% CI
All intubations	576	533	−29%	−17% to −38%
All minus CHF	505	508	−14%	−3% to −24%
CHF	71	25	−70%	−53% to −81%
Cardiac arrest	51	48	−20%	+19% to −46%
Pneumonia	32	33	−12%	+43% to −46%

Total visits ≥65 years: *1999–52,241; ^2014–61,343.

We speculate that advances in medical management and increased use of **NIPPV** and **avanced directives** have significantly impacted intubation rates in the elderly population

Gerald C. Ihra
Judith Lehberger
Helene Hochrieser
Peter Bauer
Rene Schmutz
Barbara Metnitz
Philipp G. H. Metnitz

Development of demographics and outcome of very old critically ill patients admitted to intensive care units

Intensive Care Med (2012) 38:620–626

17126 pts >80 yo admitted to ICU from 1998 to 2008

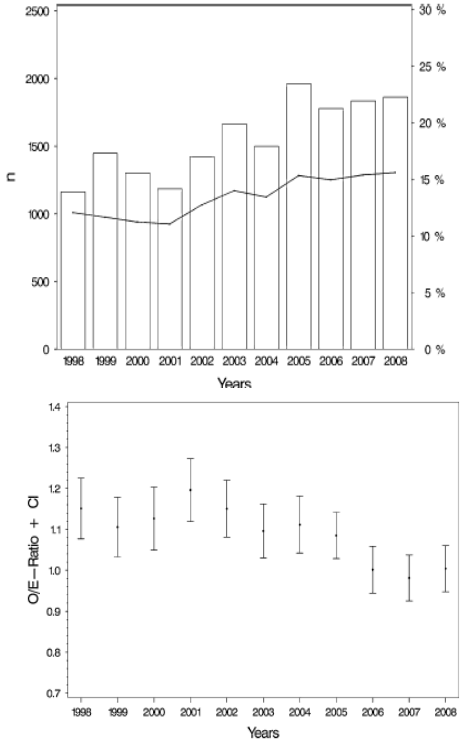


Table 2 Very old patients (>80 years): demographic data in the different time groups

	Group I (n = 5,098)	Group II (n = 4,588)	Group III (n = 7,440)	p value
Mechanical ventilation, ICU days, %	46.6	54.7	58.4	<0.0001
Noninvasive ventilation, ICU days, %	3.1	5.4	9.7	<0.0001
SAPS II score	35 (28–46)	35 (28–47)	37 (30–50)	<0.0001
SAPS II score age-corrected	17 (10–28)	17 (10–29)	19 (12–32)	<0.0001
SAPS II-predicted mortality, %	27.2	27.3	30.7	<0.0001
Observed ICU mortality, %	20.3	19.4	20.6	0.5484
Observed hospital mortality, %	31.1	30.5	31.2	0.9461
SAPS II O/E ratio (95% CI)	1.14 (1.11–1.18)	1.12 (1.08–1.16)	1.02 (0.99–1.05)	

Table 3 Logistic regression analysis for hospital mortality in very old ICU patients (n = 17,126)

Variable	Odds ratio	95% CI	p value
Age-corrected SAPS II (per unit)	1.069	(1.065–1.073)	<0.001
Acute renal failure	1.720	(1.393–2.123)	<0.001
Chronic renal failure	1.267	(1.127–1.424)	<0.001
Hematologic disease	0.628	(0.447–0.880)	0.007
Mechanical ventilation	1.049	(1.041–1.058)	<0.001
Calendar time (per year)	0.97	(0.958–0.983)	<0.001

Our results point towards the possibility that less invasive treatment options may lead to increased use of ICU in very old pts. Thus one may speculate that the increased use of NIV might be regarded as more beneficial for very old patients.

JAMA Internal Medicine | Original Investigation

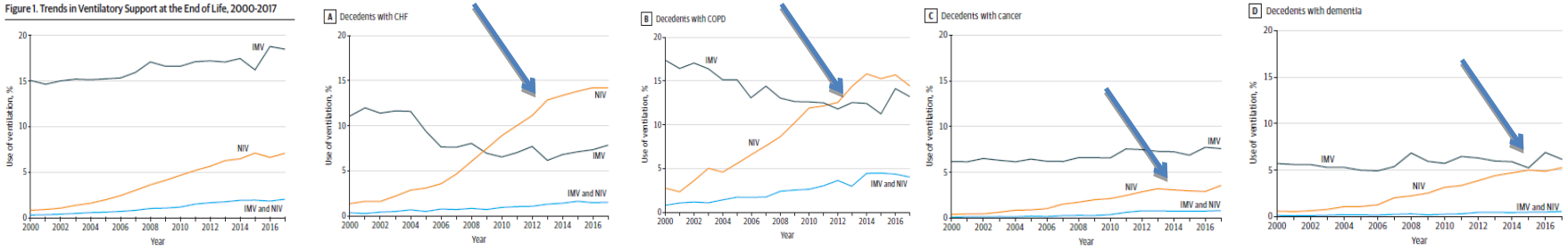
Published online October 19, 2020

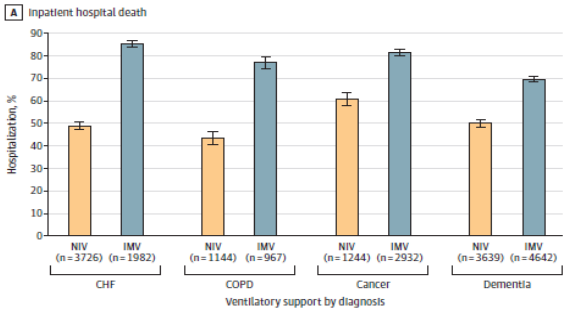
Trends in Noninvasive and Invasive Mechanical Ventilation Among Medicare Beneficiaries at the End of Life

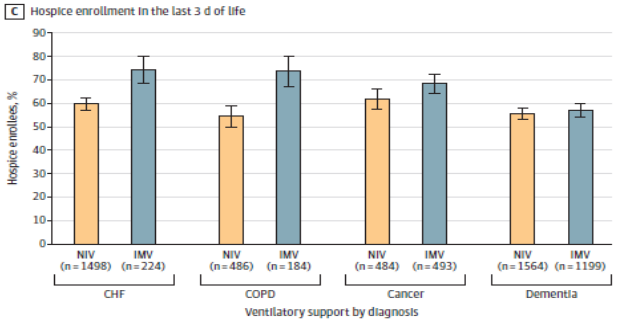
Donald R. Sullivan, MD, MA, MCR; Hyosin Kim, PhD; Pedro L. Gozalo, PhD; Jennifer Bunker, MPH; Joan M. Teno, MD, MS

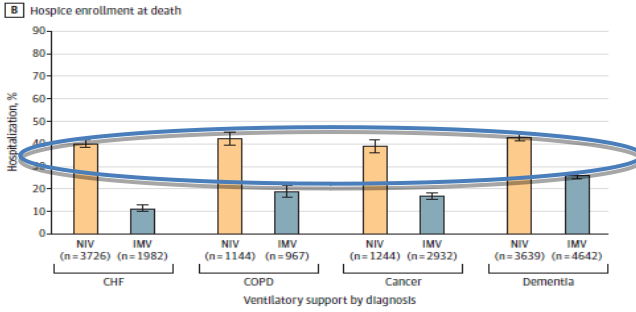
20% random sample of Medicare fee-for service beneficiaries who had an H admission in the last 30 days of their life beetween 2000 and 2017

2.470435 pts. 401.419: IMV; 90.700: NIV; 51.038 both mean age: 82.2









Ma funziona?

Auth	Des	Age (m)	n. pts	etio	outcome	Notes	Journal
Nava	RCT	81.3	41 NIV 41 SMT	AHRF (COPD)	Met ETI criteria 7% vs. 63%; reduced mortality	NIV as rescue therapy in SMT (DNI) same results	Age and Aging 2011
Nicolini	Obs. Prosp	➢ 75	121 > 75 86 < 75	COPD	Similar % failure and H mortality 6 m mortality grater in > 75 (40%)	Comorbidities, SAPS II, Kelly, NIV failure predictors of mortality	Int J Clin Pract 2014
Montoneri	Obs. Retros	➢ 85	60 > 85 113 < 85	Mix	Similar % of failure; observed mortality lower than predicted (20%)	COPD and AcPE better than other etiologies	Emerg Med J 2019
Segrelles C	Obs Prosp	➢ 80.6	85 > 75 21 < 75	Mix	Similar % of inH mortality (20%) and 1y survival (60%)	65% DNI LTOT, APACHEII, pH correlated with mortality ReH and H-NIV in >75	Arch Bronchoneumol 2012
Vargas	Obs Prosp	➢ 80	20 DNI	Mix	Discharge alive in 75%	APACHE III, n. of comorbidities n. of complications, cancer, hypox, sepsis	Aging Clin Exp Res 2014

Polmonite

Auth	Design	Age (m)	n. pts	etio	Outcome	notes	Journal
Bruno	Obs. Retrosp	86	NIV 232 IMV 137 (DNI excluded)	CAP	No difference in mortality after adjustment for confounders (40%)	IMV more severe at baseline; No signal of harm from NIV use	Plos One 2021
Valley	Obs. Retrosp	80	53267 IMV 12480 NIV 2485 both (DNI excluded)	CAP	No difference in 30d mortality after adjustment (50%)	NIV pts. Less acutely ill with less comorbidities. NIV less expensive	Crit Care Med 2017

Results of noninvasive ventilation in very old patients

Frederique Schortgen[1,2*], Arnaud Follin[1], Lucilla Piccari[1], Ferran Roche-Campo[1], Guillaume Carteaux[1], Elodie Taillandier-Heriche[3], Sebastien Krypciak[3], Arnaud W Thille[1], Elena Paillaud[3,4] and Laurent Brochard[2,4,5]

Annals of Intensive Care 2012, 2:5

376 pts. over a 2y study period; 98 > 80 yo; 278 < 80 yo

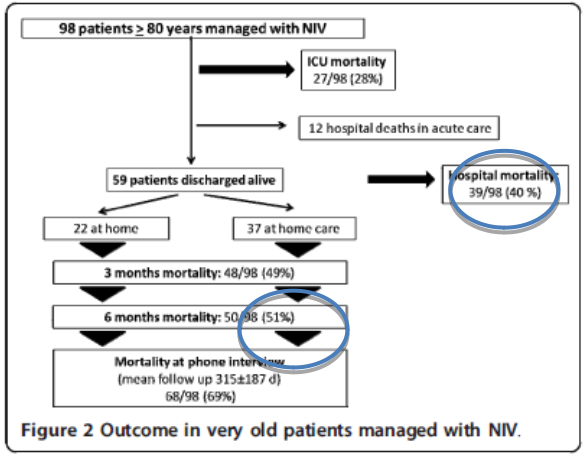


Figure 2 Outcome in very old patients managed with NIV.

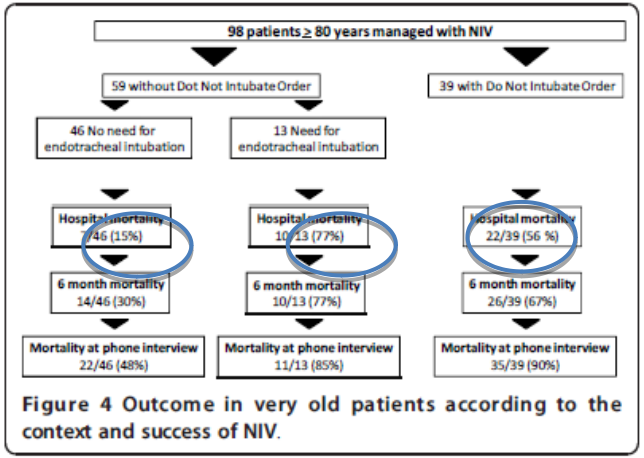


Figure 4 Outcome in very old patients according to the context and success of NIV.

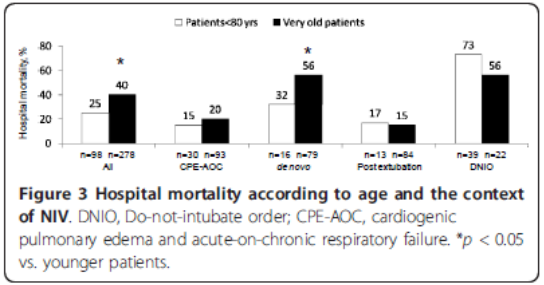


Figure 3 Hospital mortality according to age and the context of NIV. DNIO, Do-not-intubate order; CPE-AOC, cardiogenic pulmonary edema and acute-on-chronic respiratory failure. *$p < 0.05$ vs. younger patients.

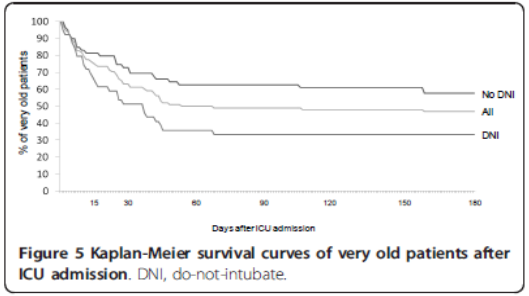


Figure 5 Kaplan-Meier survival curves of very old patients after ICU admission. DNI, do-not-intubate.

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Alain Mercat
Thomas Similowski
Laurent Papazian
Anne-Pascale Meert
Sylvie Chevret
Benoît Schlemmer
Laurent Brochard
Alexandre Demoule

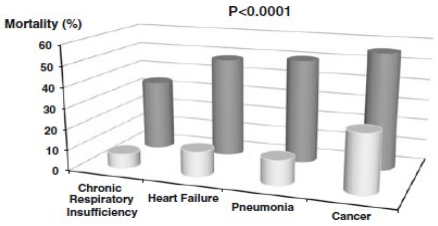
Noninvasive mechanical ventilation in patients having declined tracheal intubation

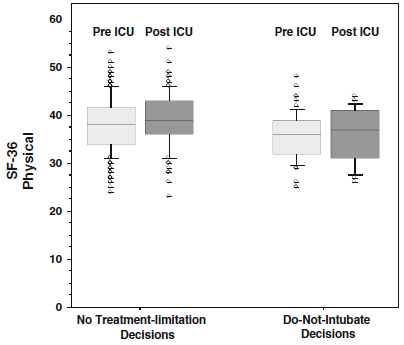
Intensive Care Med (2013) 39:292–301

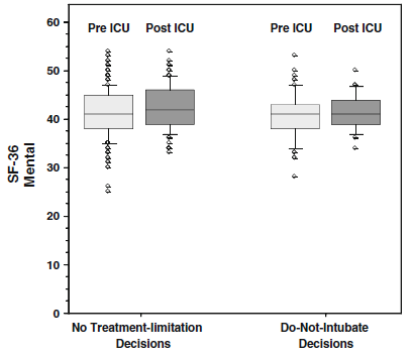
574 No TLD and 134 DMI pts treated with NIV in a 2 months period

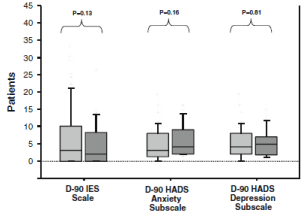
Table 2 ICU management and outcomes

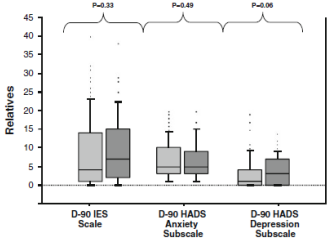
Numbers (%) or Median (interquartile range)	NoTLD patients ($N = 574$)	DNI patients ($N = 134$)	P value
SAPS 2 score	36 (27–47)	41 (35–51)	<0.0001
ICU stay	6 (3–12)	6 (3–15)	0.47
Hospital stay	16 (8–30)	15 (7–29)	0.56
ICU mortality	45 (7.8)	37 (27.6)	<0.0001
Hospital mortality	69 (12)	59 (44)	<0.0001
Day-90 mortality[b]	100 (17.4)	81 (60.4)	<0.0001











Come possiamo fare meglio?

Delirium is a Strong Predictor of Mortality in Patients Receiving Non-invasive Positive Pressure Ventilation

Ka-Yee Chan[1] · Linda S. L. Cheng[2] · Ivan W. C. Mak[1] · Shu-Wah Ng[2] · Michael G. C. Yiu[1] · Chung-Ming Chu[2]

Lung
DOI 10.1007/s00408-016-9955-3 Published online: 27 October 2016

153 pts. 49 (32%) were diagnosed with delirium; 60 died in the follow up period (1y)

Table 7 Causes of death in patients with ARF treated by NIPPV

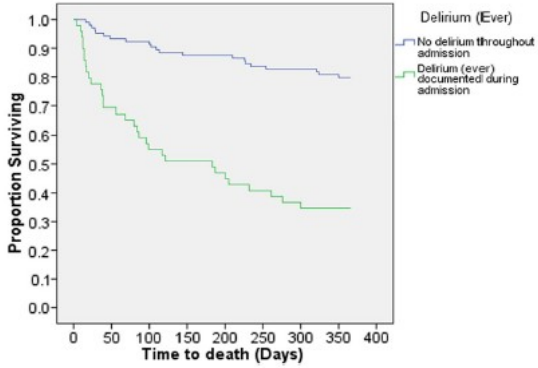
Cause of death	Number	Percentage
Respiratory failure/AE-COPD	25	41.7
Pneumonia	23	38.3
Myocardial infarction	5	8.3
Cerebrovascular accident	2	3.3
Renal failure	2	3.3
Gastrointestinal bleeding	1	1.7
AE-UIP	1	1.7
Infective endocarditis	1	1.7
Total	60	100

AE-COPD acute exacerbation of COPD, *AE-UIP* acute exacerbation of usual interstitial pneumonitis

Table 9 Survival in delirious and non-delirious patients with ARF treated by NIPPV

	Non-delirious ($n = 104$)	Delirious ($N = 49$)
30-day survival	95%	78%
1 year survival	80%	35%
Median survival	Not reached in 1 year	182 days

Log-rank test: $p < 0.001$



Parameters	Crude HR (95% CI)	*p* value	Adjusted HR (95% CI)	*p* value
APACHE II	1.106 (1.048–1.168)	<0.001	–	–
BMI	0.919 (0.859–0.983)	0.014	0.918 (0.858–0.982)	0.013
FEV_1	1.080 (0.922–1.264)	NS	–	–
Charlson's score	1.275 (1.076–1.509)	0.005	–	–
pH on admission	0.801 (0.031–21.006)	NS	–	–
$PaCO_2$ on admission	1.005 (0.921–1.096)	NS	–	–
Delirium	4.462 (2.665–7.472)	<0.001	4.398 (2.614–7.400)	< 0.001

HR hazard ratio, *95% CI* 95% confidence interval, *NS* non-significant

The impact of frailty on noninvasive mechanical ventilation in elderly medical intensive care unit patients

Iskender Kara[1] · F. Yildirim[1] · A. Zerman[1] · Z. Gullu[1] · N. Boyaci[1] · B. B. Aydogan[1] · U. Gaygisiz[1] · K. Gonderen[1] · G. Arik[2] · M. Turkoglu[3] · M. Aydogdu[4] · G. Aygencel[3] · Z. Ulger[2] · G. Gursel[4]

Aging Clin Exp Res
DOI 10.1007/s40520-017-0774-z
Published online: 16 May 2017

103 pts. (m age 73±11); the incidence of frailty was 41% (CFS>5) and 36% (EFS>8)

Table 2 Comparison of the NIV success and failure groups' characteristics and analysis of factors for the prediction of NIV failure

	Univariate analysis			Multivariate analysis	
	NIV		*p*	OR	*p*
	Failure *n*: 30 (29%) Mean ± SD	Success *n*: 73 (71%) Mean ± SD			
Glascow Coma Scale[a]	**12 ± 3**	**14 ± 2**	**0.011**	**1.2 (1.01–1.4)**	**0.042**
SOFA score[a]	**5 ± 2**	**3 ± 3**	**0.003**		
Mortality, *n* (%)	**17 (57)**	**1 (1)**	**0.001**		
CFS ≥ 5, *n* (%)[a]	**18(60)**	**24(33)**	**0.015**		
CFS	5 ± 2	4 ± 2	0.082		
EFS ≥ 8, *n* (%)[a]	**17 (57)**	**20 (27)**	**0.007**	**2.8 (1.1–7.1)**	**0.027**
EFS	**8 ± 3**	**6 ± 3**	**0.025**		

Table 3 The univariate and multivariate analysis of factors affecting mortality

	Univariate analysis			Multivariate analysis	
	Discharge *n*: 85 (83%) Mean ± SD	Exitus *n*: 18 (17%) Mean ± SD	*p* value	OR	*p* value
Age (years)	**72 ± 10**	**78 ± 11**	**0.033**		
Gender, male *n* (%)	46 (54)	11(61)	0.392		
APACHE II[a]	**20 ± 6**	**24 ± 6**	**0.035**		
Glascow Coma Scale	13 ± 3	12 ± 3	0.052		
SOFA score[a]	**3 ± 3**	**5 ± 2**	**0.028**		
Charlson comorbidity score[a]	**6 ± 2**	**7 ± 2**	**0.042**		
Home long term oxygen therapy, *n* (%)[a]	**41 (48)**	**4 (22)**	**0.037**		
Home NIV, *n* (%)[a]	**22 (26)**	**0 (0)**	**0.008**		
NIV failure, *n* (%)[a]	**13 (15)**	**17 (94)**	**0.001**	**129 (13–1258)**	**0.0001**
NIV application problem, *n* (%)	**50 (59)**	**15 (83)**	**0.041**		
CFS ≥ 5, *n* (%)[a]	**27 (32)**	**15 (83)**	**0.001**	**16 (3–90)**	**0.002**
EFS ≥ 8, *n* (%)[a]	**24 (28)**	**13 (72)**	**0.001**		

Table 4 The relationship between the patients' characteristics and NIV application problems

	No application problem *n*: 38 (37%) Mean ± SD	Application problem *n*: 65 (63%) Mean ± SD	*p*
Delirium state[a]	**1/31 (3)**	**12/57 (21)**	**0.024**
Depression	11/31 (36)	32/57 (56)	0.077
Dementia[a]	**2/31 (7)**	**13/57 (23)**	**0.044**
Living with family, *n* (%)[a]	**36 (95)**	**50 (77)**	**0.026**
Living with a caregiver, *n* (%)	0	6 (9)	0.054
Living within a long-term care facility, *n* (%)	0	4 (6)	0.119
CFS score > 5, *n* (%)[a]	**11 (29)**	**31 (48)**	**0.047**
EFS ≥ 8, *n* (%)[a]	**9 (24)**	**28 (43)**	**0.037**

Conclusioni

- Una percentuale crescente di grandi anziani riceve procedure di «critical care» e, tra queste, la NIV
- Nelle sue indicazioni «classiche» e al di fuori di un programma «DNI» la NIV ha una percentuale di successo paragonabile a quella dei soggetti più giovani (maggiore mortalità a 6m-1anno)
- Attenzione alla selezione del paziente (mortalità in caso di fallimento)
- L'uso «palliativo» della NIV necessita di maggiori evidenze, ma può non rappresentare un «overtreatment»
- L'attenzione a condizioni quali il delirium o lo stato di fragilità aumenta la probabilità di successo della metodica








Grazie per l'attenzione

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PERUGIA