



Baseline Characteristics and Outcomes of 1591 Patients Infected With SARS-CoV-2 Admitted to ICUs of the Lombardy Region, Italy

JAMA | Original Investigation

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- 義大利是目前全世界COVID-19疫情第二嚴重的國家,僅次美國
- 本研究是描述義大利倫巴底大區住進ICU的COVID-19確診病人之臨床特徵
- 需於ICU照顧的COVID-19病患以老年男性居多
- 68%的病人有至少一項共病症(慢性病),以高血壓為最多
- 99%的ICU患者需要呼吸輔助治療, 88%的ICU患者需要插管及呼吸器支持
- 以63歲(年齡中位數)為區分, 年齡較大的患者所需的FiO₂較高, 但是PEEP則無差異
- 27% 的病人需要採俯臥呼吸輔助, 有1%的病人需要使用葉克膜(ECMO)
- ICU病患的轉出率(離開ICU)約16%, 死亡率約26%
- 所有患者ICU住院天數之中位數為8天, 但死亡個案的中位數為7天
- 本研究估計約有9%的COVID-19確診個案需要ICU照顧
- 如何擴充ICU的容量是未來醫療政策上需要詳細規劃的方向

總結

- 本研究描述義大利倫巴底大區住進ICU的COVID-19確診病人之臨床特徵
- 需要於ICU照顧的COVID-19病患以老年男性居
- 68%的病人有至少一項共病症,以高血壓最多
- 99%的ICU患者需要呼吸輔助治療, 88%的ICU患者需要插管及呼吸器支持
- 以63歲(年齡中位數)為區分, 年齡較大的患者所需的FiO₂較高, 但是PEEP則無差異
- 27% 的病人需要採俯臥呼吸輔助, 有1%的病人需要使用葉克膜(ECMO)
- ICU病患的轉出率(離開ICU)約16%, 死亡率約26%
- 所有患者於ICU住院天數之中位數為8天, 但死亡個案的中位數為7天
- 本研究估計大約有9%的確診個案會需要加護病房的照顧
- 瞭解這些住進ICU的病患特徵有助於政府與衛生當局制訂政策以因應疫情

前言

- 2020年3月11日, 世界衛生組織(WHO)正式宣布SARS-CoV-2 疫情蔓延成全球大流行(Pandemic)
- COVID-19的病人有很高的比例演變成需要住院或住ICU治療
- 2020年2月20日, 義大利北部的倫巴底大區(Lombardy)出現第一個因為呼吸衰竭而住進ICU的COVID-19確診病患
- 之後義大利的疫情開始爆發, 直到3月27日, 義大利已經成為疫情世界第二嚴重的國家, 僅次於美國

前言

- 為了因應疫情, 倫巴底大區政府與衛生單位組織了一個加護病房網絡, 稱為COVID-19 Lombardy ICU Network, 並由義大利歷史最悠久且位於米蘭的Maggiore Policlinico 醫院基金會協調運作 (Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milan) (註)
- 此ICU network 處理了如指數成長般暴增的病人, 並安排ICU以提供呼吸支持治療

註: IRCCS=Istituto di Ricovero e Cura a Carattere Scientifico (義大利文)

(即Scientific Institute for Research, Hospitalization and Health care)

前言

- 直到2020年3月18日, 在倫巴底大區共有17713位檢測SARS-CoV-2 陽性的病人, 其中1593 (9%)曾經住過ICU
- 根據之前中國的數據顯示, 所有COVID-19的住院病人中, 需要ICU照顧的約有5~32%
- 因為每個國家可運用的ICU床數都不同, 所以瞭解這些需要住進ICU病房的病患特徵有助於政府與衛生當局制訂政策以因應疫情
- 本研究主要是描述義大利北部倫巴底大區所有經ICU network安排住進ICU病房的COVID-19確診病人的臨床特徵

方法

- 本研究為回溯性研究, 由位於米蘭的Maggiore Policlinico 醫院基金會執行, 該基金會同時也是COVID-19 Lombardy ICU Network的協調中心
- 本研究所納入的個案為在2020年2月20日到3月18日之間, 所有經real time RT PCR確診, 經轉介到Maggiore Policlinico 醫院, 再分別由Lombardy ICU Network旗下72個合作醫院的ICU所收治的COVID-19病人
- 因為是回溯性的研究, 所以本研究免除了病患告知同意的步驟

方法

- 根據WHO的指引, SARS-CoV-2的實驗室確診(laboratory confirmation)定義為鼻咽拭子檢體或下呼吸道抽取液檢體的real time RT PCR呈現陽性反應
- 資料的收集由ICU network協調中心人員根據線上電子工作表(electronic worksheet) 以電話訪問各醫院ICU的重症醫師
- 資料的收集時間點為病患入住ICU之後6~24小時內, 包括年齡, 性別, 共病症, 呼吸輔助治療模式(侵入性呼吸器, 非侵入性呼吸器, 氧氣面罩), 吐氣末正壓(positive end expiratory pressure, PEEP),吸入氧氣分率 (fraction of inspired oxygen , FiO_2), 動脈血氧分壓(arterial partial pressure of oxygen, PaO_2), PaO_2/FiO_2 ratio,葉克膜 (extracorporeal membrane oxygenation ,ECMO)的使用與否, 以及是否採用俯臥姿(prone position)
- 死亡個案數,出院個案數,持續住院個案數,及住院天數統計到2020年3月25日

統計分析

- 連續變數 (continuous variables)以中位數(median) 及四分位距 (interquartile range ,IQR)合併95%信賴區間(CIs) 來呈現
- 類別變數(categorical variables)以病人數(百分比)合併95%信賴區間(CIs) 來表示
- 病患特徵分布差異(differences in distributions), 例如以年齡中位數分組, 或以是否有高血壓來分組, 則以差異(differences) 合併95%信賴區間(CIs) 表示
- 病人依據年齡(age)及中位數年齡(median age)來分組, 其中年齡分組包含 0~20, 21~40, 41~50, 51~60, 61~70, 71~80, 81~90, 91~100歲; 較年輕組(younger)與較老年組(older)分別定義為小於年齡中位數及等於/大於年齡中位數

統計分析

- 用Mann-Whitney rank sum test作為年齡中位數分組(median age subgroups)以及高血壓分組(hypertension) 等連續變數的無母數分析(non-parametric continuous variables)
- χ^2 及 Fisher exact test 則用於類別變項的統計分析
- 所有統計測驗皆為雙尾(two tailed), 統計顯著性則定義為p值小於0.05
- 所有統計皆未經校正為多重比較分析(multiple comparison), 所以可能出現 type I error, 研究發現應被解讀為探索性(exploratory)與描述性(descriptive)的結果

結果

- 從2020年2月20日到3月18日, 共有1694位疑似或是確診的COVID-19病人被轉介到COVID-19 Lombardy ICU Network的協調中心, 其中有77位的結果尚未得知, 24位的結果為陰性, 有2位的結果無法取得, 所以總共有1591位COVID-19確診患者被收納於本研究中
- 82%為男性 (1304 / 1591, [95%CI,79.98%-83.82%])
- 年齡中位數為 63歲 (IQR,56-70) (range, 14-91 歲 [95% CI, 63-64])
- 有363位超過71歲(含) (23% [95% CI, 21%-25%]), 203位小於51歲 (13% [95% CI, 11%-15%]).
- 本研究作為分組的年齡為小於63歲 (含) (younger) 或是大於64歲(含) (older)

Table 1. Demographic and Clinical Characteristics of Patients in the First 24 Hours of ICU Admission for COVID-19 in Lombardy, Italy

	Patients by age, y, No. (%)								
	All	0-20	21-40	41-50	51-60	61-70	71-80	81-90	91-100
No. (%)	1591 (100)	4 (<1)	56 (4)	143 (9)	427 (27)	598 (38)	341 (21)	21 (1)	1 (<1)
Age, median (IQR), y	63 (56-70)	16 (14-19)	34 (31-38)	47 (44-49)	56 (54-59)	65 (63-68)	74 (72-76)	83 (81-84)	91
Males	1304 (82)	3 (75)	44 (79)	119 (83)	355 (83)	484 (81)	279 (82)	19 (90)	1 (100)
Females	287 (18)	1 (25)	12 (21)	24 (17)	72 (17)	114 (19)	62 (18)	2 (10)	0
Comorbidities, No. with data	1043	3	35	82	273	380	253	1	1
None	334 (32)	0	23 (66)	50 (61)	107 (39)	107 (28)	47 (19)	0	0
Hypertension	509 (49)	0	4 (11)	21 (26)	121 (44)	195 (51)	156 (62)	12 (75)	0
Cardiovascular disease ^a	223 (21)	0	1 (3)	4 (5)	43 (16)	87 (23)	81 (32)	6 (38)	1 (100)
Hypercholesterolemia	188 (18)	0	1 (3)	1 (1)	30 (11)	92 (24)	59 (23)	5 (31)	0
Diabetes, type 2	180 (17)	0	1 (3)	4 (5)	40 (15)	86 (23)	46 (18)	3 (19)	0
Malignancy ^b	81 (8)	0	0	2 (2)	10 (4)	33 (9)	33 (13)	3 (19)	0
COPD	42 (4)	0	1 (3)	0	8 (3)	12 (3)	20 (8)	1 (6)	0
Chronic kidney disease	36 (3)	0	0	2 (2)	10 (4)	17 (4)	7 (3)	0	0
Chronic liver disease	28 (3)	0	0	2 (2)	8 (3)	13 (3)	5 (2)	0	0
Other ^c	205 (20)	3 (100)	6 (17)	10 (12)	49 (18)	77 (20)	55 (22)	5 (31)	0

- 68%的病人有至少一項共病症 (95% CI, 65%-71%)
- 49% (509/1043,[95%CI, 46%-52%]) 有高血壓
- 21% (223/1043,[95%CI, 19%-24%]) 有心血管疾病
- 18% (188/1043, [95% CI, 16%-20%])有高膽固醇血症
- 4% (42/1043, [95% CI, 3%-5%]) 有慢性阻塞性肺病 COPD.
- 所有80歲以上的病人都有至少一項共病症

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	All	0-20	21-40	41-50	51-60	61-70	71-80	81-90	91-100
Respiratory support, No.	1300	2	46	108	351	487	287	18	1
Invasive mechanical ventilation	1150 (88)	2 (100)	37 (80)	87 (81)	315 (90)	449 (92)	246 (86)	14 (78)	0
Noninvasive ventilation	137 (11)	0	8 (17)	16 (15)	33 (9)	36 (7)	39 (14)	4 (22)	1 (100)
Oxygen mask	13 (1)	0	1 (2)	5 (5)	3 (1)	2 (<1)	2 (1)	0	0
PEEP, cm H ₂ O									
No.	1017	2	33	81	278	377	234	11	1
Median (IQR)	14 (12-16)	9.5 (5-14)	14 (10-15)	14 (12-15)	14 (12-15)	14 (12-16)	14 (12-15)	12 (8-15)	10
FIO ₂ , %									
No.	999	2	31	81	270	375	228	11	1
Median (IQR)	70 (50-80)	40 (30-50)	60 (50-70)	60 (50-80)	65 (50-80)	70 (55-80)	70 (50-80)	60 (50-90)	60
Pao ₂ /Fio ₂ ratio									
No.	781	2	26	58	213	306	169	7	0
Median (IQR)	160 (114-220)	259 (195-323)	201.5 (123-248)	168.5 (112-260)	163 (120-230)	152.5 (110-213)	163 (120-205)	150 (86-250)	NA
Prone position, No./total (%)	240/875 (27)	0/2	3/25 (12)	24/71 (34)	70/247 (28)	90/337 (27)	51/187 (27)	2/6 (33)	NA
ECMO, No./total (%)	5/498 (1)	NA	0/15	0/42	2/149 (1)	3/193 (2)	0/95	0/4	NA

- 99% (1287/1300, [95%CI, 98%-99%]))住進ICU的病人需要呼吸輔助
- 88% (1150/1300, [95% CI, 87%-90%])需要插管並使用呼吸器
- 11% (137/1300, [95% CI, 9%-12%]) 只需要非侵入性呼吸輔助

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ECMO, No./total (%)	5/498 (1)	NA	0/15	0/42	2/149 (1)	3/193 (2)	0/95	0/4	NA

- 88%(565/645,[95% CI, 85%-90%]) 小於63歲的病人需要侵入性呼吸輔助
- 89%(585/655 [95%CI, 87%-92%]) 大於64歲的病人需要侵入性呼吸輔助
(difference, -2%[95%CI, -5%to 2%]; P = 0.33)

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ECMO, No./total (%)	5/498 (1)	NA	0/15	0/42	2/149 (1)	3/193 (2)	0/95	0/4	NA

- 11%(70/645,[95% CI, 9%-14%])小於63歲的病人需要非侵入性呼吸輔助
- 10%(67/655 [95%CI, 8%-13%]) 大於64歲的病人需要非侵入性呼吸輔助
(difference,-1% [95% CI, -4% to 3%]; P = 0.71)

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- PEEP中位數(IQR) 為14 (12-16) cm H₂O (n = 1017), 最高可到22 cm.
- 89% (887/999, [95% CI, 87%-91%]) 需要至少50%的FiO₂
- 12% (120/999, [95% CI, 10%-14%]) 需要100%的FiO₂

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Prone position, No./total (%)	240/875 (27)	0/2	3/25 (12)	24/71 (34)	70/247 (28)	90/337 (27)	51/187 (27)	2/6 (33)	NA
ECMO, No./total (%)	5/498 (1)	NA	0/15	0/42	2/149 (1)	3/193 (2)	0/95	0/4	NA

- PaO₂/FiO₂ ratio 中位數為 160 (IQR, 114-220 [95% CI, 152-166])(n = 781).
- 年齡分組的PEEP中位數並無顯著差異 (≤63歲, 14 [IQR, 12-15] vs ≥64歲, 14 [IQR, 12-16] cm H₂O, median difference, 0 [95% CI, 0-0]; P = 0.94)
- 老年組所需之FiO₂較高 (≤63 歲, 60% [IQR, 50%-80%] vs ≥64歲, 70% [IQR, 50%-80%], median difference, -10% [95% CI, -14% to -6%; P = 0.006)

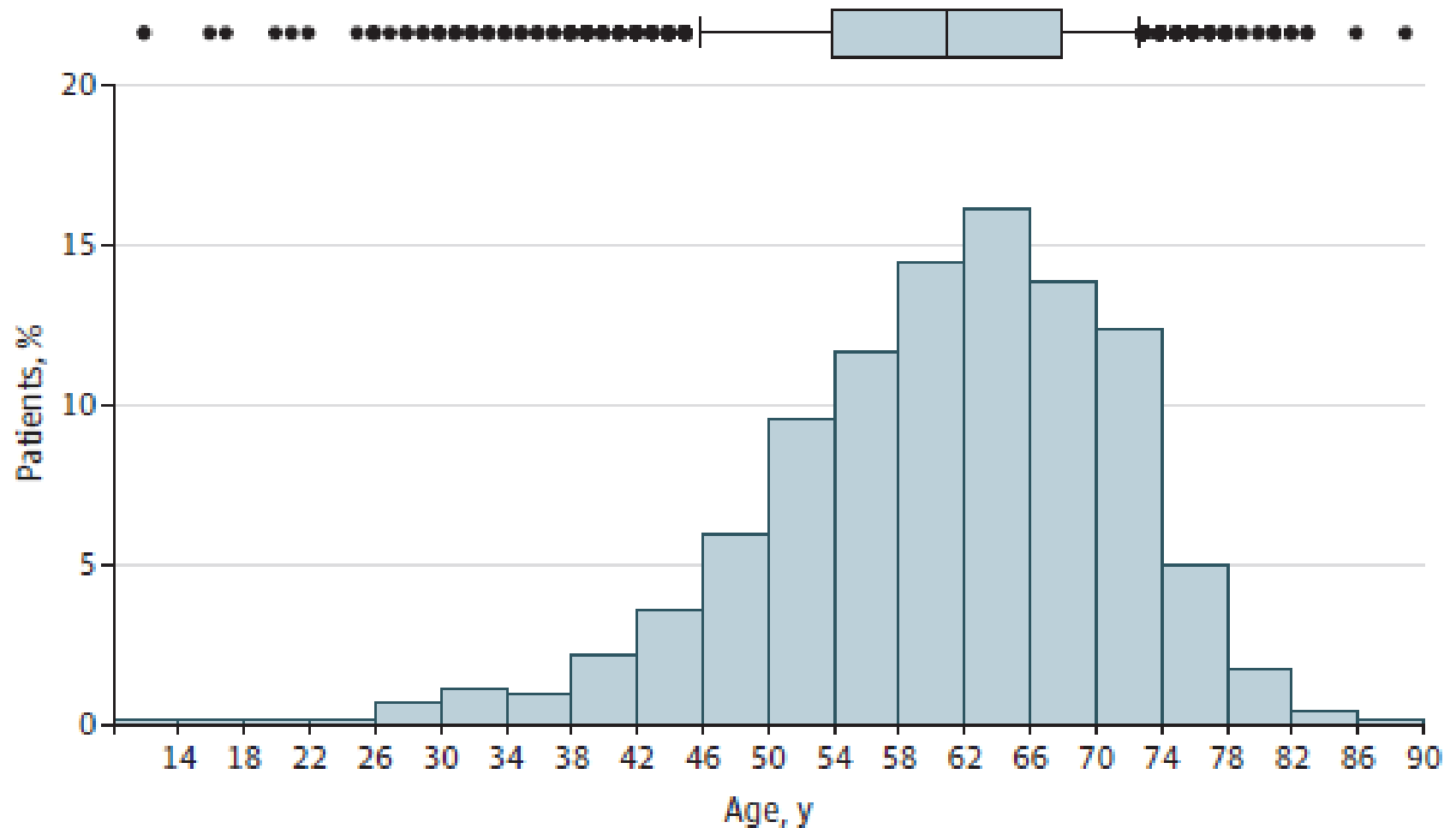
Table 1. Demographic and Clinical Characteristics of Patients in the First 24 Hours of ICU Admission for COVID-19 in Lombardy, Italy

	Patients by age, y, No. (%)								
	All	0-20	21-40	41-50	51-60	61-70	71-80	81-90	91-100
Respiratory support, No.	1300	2	46	108	351	487	287	18	1
Invasive mechanical ventilation	1150 (88)	2 (100)	37 (80)	87 (81)	315 (90)	449 (92)	246 (86)	14 (78)	0
Noninvasive ventilation	137 (11)	0	8 (17)	16 (15)	33 (9)	36 (7)	39 (14)	4 (22)	1 (100)
Oxygen mask	13 (1)	0	1 (2)	5 (5)	3 (1)	2 (<1)	2 (1)	0	0
PEEP, cm H ₂ O									
No.	1017	2	33	81	278	377	234	11	1
Median (IQR)	14 (12-16)	9.5 (5-14)	14 (10-15)	14 (12-15)	14 (12-15)	14 (12-16)	14 (12-15)	12 (8-15)	10
FiO ₂ , %									
No.	999	2	31	81	270	375	228	11	1
Median (IQR)	70 (50-80)	40 (30-50)	60 (50-70)	60 (50-80)	65 (50-80)	70 (55-80)	70 (50-80)	60 (50-90)	60
PaO ₂ /FiO ₂ ratio									
No.	781	2	26	58	213	306	169	7	0
Median (IQR)	160 (114-220)	259 (195-323)	201.5 (123-248)	168.5 (112-260)	163 (120-230)	152.5 (110-213)	163 (120-205)	150 (86-250)	NA
Prone position, No./total (%)	240/875 (27)	0/2	3/25 (12)	24/71 (34)	70/247 (28)	90/337 (27)	51/187 (27)	2/6 (33)	NA
ECMO, No./total (%)	5/498 (1)	NA	0/15	0/42	2/149 (1)	3/193 (2)	0/95	0/4	NA

- 老年組的PaO₂/FiO₂ 也比年輕組的低 (≤63歲, 163.5 [IQR, 120-230] vs ≥64歲, 156 [IQR, 110-205]; median difference, 7 [95% CI, -8 to 22]; P = 0.02)
- 在剛住院時, 27% (240/875, [95% CI, 25%-31%]) 的病人需要採俯臥呼吸輔助, 有1% (5/ 498, [95% CI, 0.3%-2%]) 的病人需要使用ECMO

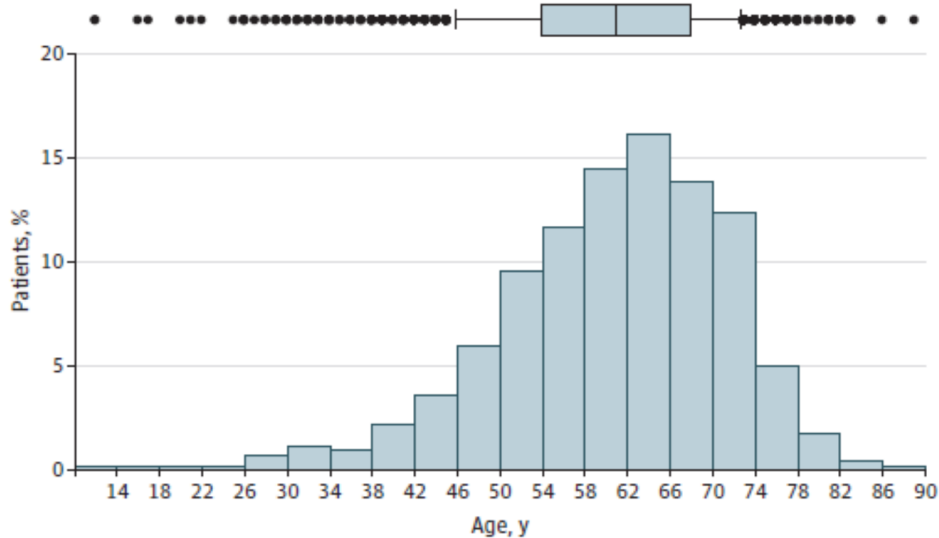
病患年齡之分布

A Age (n = 1591)



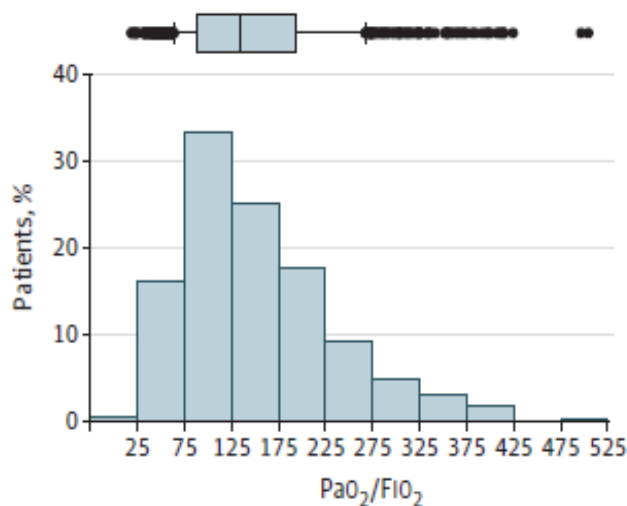
年齡與呼吸測量之分布

A Age (n=1591)

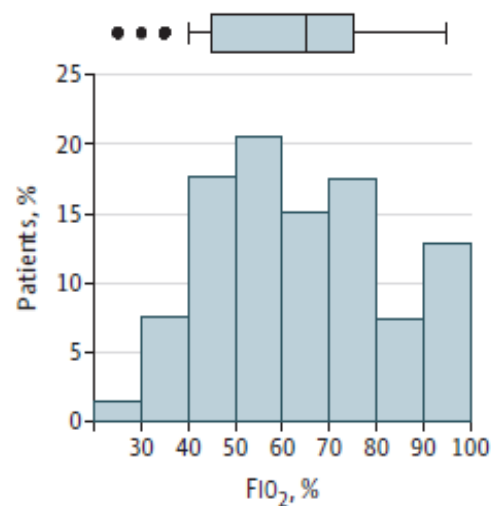


- PEEP: positive end-expiratory pressure;
- FIO₂: fraction of inspired oxygen;
- PaO₂: arterial partial pressure of oxygen.
- Boxplots show the 25th, 50th, and 75th percentiles (box); 10th and 90th percentiles (whiskers); and outlying points (circles).

B PaO₂/FIO₂ ratio (n=781)



C FIO₂ (n=999)



D PEEP (n=1017)

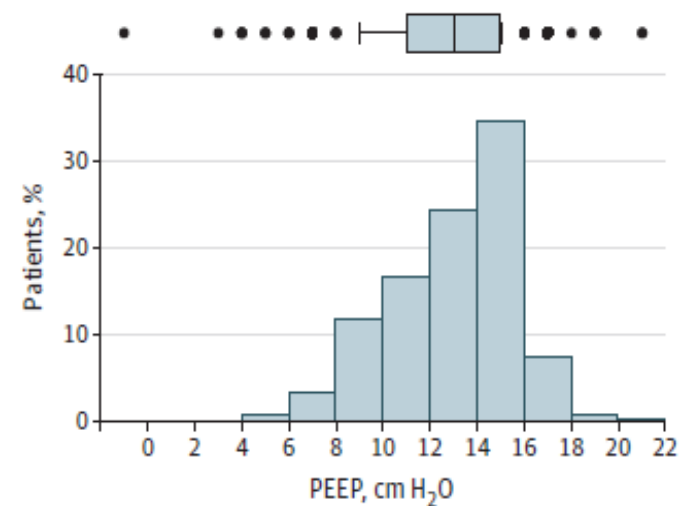


Table 2. Patient Disposition From COVID-Only Intensive Care Units (ICUs). Total and Stratified by History of Hypertension

	Patients by age, y, No. (%)								
	All (N = 1591)	0-20 (n = 4)	21-40 (n = 56)	41-50 (n = 143)	51-60 (n = 427)	61-70 (n = 598)	71-80 (n = 341)	81-90 (n = 21)	91-100 (n = 1)
Overall									
Outcome, No. with data	1581	2	56	142	423	596	340	21	1
Died in ICU	405 (26)	0	4 (7)	16 (11)	63 (15)	174 (29)	136 (40)	11 (52)	1 (100)
Discharged from ICU	256 (16)	0	20 (36)	35 (25)	90 (21)	69 (12)	40 (12)	2 (10)	0
Still in ICU as of 3/25/2020 ^a	920 (58)	2 (100)	32 (57)	91 (64)	270 (64)	353 (59)	164 (48)	8 (38)	0
Patients with hypertension^b									
No.	509	0	4 (<1)	21 (4)	121 (24)	195 (38)	156 (31)	12 (2)	0
Outcome									
Died in ICU	195 (38)	0	0	4 (19)	24 (20)	82 (42)	78 (50)	7 (58)	0
Discharged from ICU	84 (16)	0	1 (25)	8 (38)	26 (21)	25 (13)	23 (15)	1 (8)	0
Still in ICU as of 3/25/2020 ^a	230 (58)	0	3 (75)	9 (43)	71 (59)	88 (45)	55 (35)	4 (33)	0
Patients without hypertension^b									
No.	526	1 (<1)	31 (6)	60 (11)	148 (28)	184 (35)	97 (18)	4 (1)	1 (<1)
Outcome									
Died in ICU	114 (22)	0	3 (10)	3 (5)	21 (14)	43 (23)	40 (41)	3 (75)	1 (100)
Discharged from ICU	128 (24)	0	17 (55)	19 (32)	47 (32)	33 (18)	12 (12)	0	0
Still in ICU as of 3/25/2020 ^a	284 (54)	1 (100)	11 (35)	38 (63)	80 (54)	108 (59)	45 (46)	1 (25)	0

^a Patients were admitted between 2/20/2020 and 3/18/2020, with follow-up through 3/25/2020.

^b Hypertension status for those with outcome data was available for 1035 patients; hypertension status overall was available for 1043 patients.

比較有**高血壓** (n=509)與沒有高血壓(n=526) 的病人, 高血壓患者

- **年齡明顯較大**(年齡中位數, 66 歲[IQR, 60-72] vs 62歲 [IQR, 54-68] ; median difference, 4 [95% CI, 2-6]; P <0 .001)
- **所需之PEEP 較高** (中位數 [IQR], 14 [12-16] vs 14 [12-15] cm H₂O; median difference, 0 [95%CI, 0-0]; P = 0.003)
- **PaO₂/FiO₂ 也較低** (中位數, 146 [IQR, 105-214] vs 173 [IQR, 120-222]; median difference, -27 [95% CI, -42 to -12; P =0.005)
- **但是, FiO₂沒有差別** (中位數,70 [IQR, 50-80] vs 60 [IQR, 50-80; median difference, 10 [95% CI, 6-14]; P = 0.05).

Table 2. Patient Disposition From COVID-Only Intensive Care Units (ICUs), Total and Stratified by History of Hypertension

	Patients by age, y, No. (%)								
	All (N = 1591)	0-20 (n = 4)	21-40 (n = 56)	41-50 (n = 143)	51-60 (n = 427)	61-70 (n = 598)	71-80 (n = 341)	81-90 (n = 21)	91-100 (n = 1)
Overall									
Outcome, No. with data	1581	2	56	142	423	596	340	21	1
Died in ICU	405 (26)	0	4 (7)	16 (11)	63 (15)	174 (29)	136 (40)	11 (52)	1 (100)
Discharged from ICU	256 (16)	0	20 (36)	35 (25)	90 (21)	69 (12)	40 (12)	2 (10)	0
Still in ICU as of 3/25/2020 ^a	920 (58)	2 (100)	32 (57)	91 (64)	270 (64)	353 (59)	164 (48)	8 (38)	0
Patients with hypertension^b									
No.	509	0	4 (<1)	21 (4)	121 (24)	195 (38)	156 (31)	12 (2)	0
Outcome									
Died in ICU	195 (38)	0	0	4 (19)	24 (20)	82 (42)	78 (50)	7 (58)	0
Discharged from ICU	84 (16)	0	1 (25)	8 (38)	26 (21)	25 (13)	23 (15)	1 (8)	0
Still in ICU as of 3/25/2020 ^a	230 (58)	0	3 (75)	9 (43)	71 (59)	88 (45)	55 (35)	4 (33)	0
Patients without hypertension^b									
No.	526	1 (<1)	31 (6)	60 (11)	148 (28)	184 (35)	97 (18)	4 (1)	1 (<1)
Outcome									
Died in ICU	114 (22)	0	3 (10)	3 (5)	21 (14)	43 (23)	40 (41)	3 (75)	1 (100)
Discharged from ICU	128 (24)	0	17 (55)	19 (32)	47 (32)	33 (18)	12 (12)	0	0
Still in ICU as of 3/25/2020 ^a	284 (54)	1 (100)	11 (35)	38 (63)	80 (54)	108 (59)	45 (46)	1 (25)	0

^a Patients were admitted between 2/20/2020 and 3/18/2020, with follow-up through 3/25/2020.

^b Hypertension status for those with outcome data was available for 1035 patients; hypertension status overall was available for 1043 patients.

- 有58% (920/1581, [95% CI, 56%-61%]) 仍然住在ICU
- 有16% (256/1581, [95% CI, 14%-18%]) 已經從ICU轉到一般病房
- 有26% (405/1581, [95% CI, 23%-28%])死於ICU
- ICU住院天數之中位數為8天(5-12 [95% CI, 8-9])
- 若只看死亡個案(n=405), 其ICU住院天數之中位數為7天(5-11[95% CI, 7-8])
- 死亡個案中, 有高血壓的比例 (63%, 195/309)高於順利出院的比例(40%, 84/212)
(difference, 23% [95% CI, 15%-32%]; P <0.001)

討論

- 本研究顯示住在ICU的病人大部分是老年男性, 絕大部分需要呼吸器輔助, 所需的PEEP偏高, 而且ICU死亡率大約26%
- 大部分住到ICU的原因都是急性呼吸衰竭, 約88%需要插管接上呼吸器輔助呼吸, 約有11%只需要非侵入性之呼吸輔助
- 本研究中需要侵入性呼吸輔助的ICU病人比例高於其他ICU病人的報告, 例如 71% (Arentz M. et al,美國華盛頓州), 47% (Wang D. et al,中國武漢), 42% (Yang X.et al,中國武漢) 以及 30% (Huang C. et al,中國武漢, 其中一半用ECMO治療).
- 本研究中需要侵入性呼吸輔助的COVID-19病重患者同樣比2份中國武漢的報告高, 分別是17% (Zhou F. et al)及15% (Guan WJ.et al)

討論

- 相反的, 跟之前其他的報告相比, 使用非侵入性呼吸輔助的ICU病人比例, 不管是在ICU內還是ICU外, 都比本研究來的高, 例如19% (Arentz M. et al, 美國華盛頓州), 42% (Wang D. et al, 中國武漢), 56% (Yang X. et al, 中國武漢) 以及 62% (Huang C. et al, 中國武漢, 包括使用高流量鼻導管 high flow nasal cannula)
- 如果是比較所有確診之COVID-19的患者的話, 約有14%只需要非侵入性呼吸輔助治療, 而所有住院病人中, 則有32%可用非侵入性呼吸輔助治療
- 本研究中插管的比例偏高, 可能是因為缺氧的嚴重度較高($\text{PaO}_2/\text{FiO}_2$ 中位數為 160), 因此需要較高的PEEP, 但有其他的報告指出ICU病人的 $\text{PaO}_2/\text{FiO}_2$ 比例約136左右, 所以另外可能的解釋是義大利北部需要非侵入性呼吸輔助的病人大多可以在普通病房治療, 不需要住進ICU, 所以拉高了本研究中ICU病人插管的比例

討論

- 本研究中的病人大多是男性(82%, 比其他的研究報告高出許多)與老年人
- 住進ICU的年齡中位數為63歲(IQR, 56-70), 這與義大利所有COVID-19確診患者的中位數一樣, 都是63歲, 這代表高齡本身不是住進ICU的危險因子
- 本研究中, 68%的病人至少有一項慢性病, 此比例高於其他的報告(GuanWJ, et al, Huang C, et al), 但是跟其他報告相似之處是, 高血壓是最常見的, 其次是心血管疾病, 高膽固醇血症, 與糖尿病, 另外有一群人是以肺部疾患為主
- 過去其他報告中顯示ICU病患的死亡率分別有16%(Wang D,et al), 38% Huang C, et al), 62% (Yang X, et al), 67% (Arentz M,et al) and 78% (Zhou F,et al)
- 本研究中, 住進ICU五週後, 大約還有58%的病人住在ICU裡,16%的病人可以離開ICU, 26%的病人死於ICU, 而且年齡越大的, 死亡率越高, 不過因為還有很多人住在ICU裡, 所以死亡率可能會更高

討論

- 本篇研究是目前已知因COVID-19而住進ICU治療中病患數量最大的報告
- 在西方國家中, 義大利似乎有最高比例的COVID-19重症患者, 這些病患大多有中重度的呼吸衰竭, 且多需要呼吸器治療
- 本研究反映出世界上醫療系統組成的差異, 例如在義大利, 非侵入性的呼吸輔助治療可用於一般病房, 也可用於ICU, 但不論是在原本的ICU或是新建的ICU, 由重症專科醫師所提供之加護照顧的數量則不得而知
- 目前義大利第二等級的ICU (包含能提供高流量氧氣, 持續性呼吸道正壓, 或是非侵入性呼吸輔助治療)的床數預期會越來越多, 以因應COVID-19疫情中越來越多的重症病人
- 本研究資料也指出在COVID-19的疫情中, 重症醫療的需求是非常龐大的, 保守估計是大約有9%的確診個案會需要加護病房的照顧, 所以如何擴充ICU的收治容量是未來需要詳細規劃的方向

限制

本研究有數個限制之處

- 這是一項回溯性研究, 而且資料的收集來自電話訪談
- 目前倫巴底大區的狀況非常危急, 無法讓本研究協調人能獲得更詳細的資訊, 例如病患所使用的藥物
- 目前所追蹤的時間仍然非常短, 所以死亡率與住院天數可能還會有所改變
- 本研究中仍有許多漏失的資料, 因此對推測預後有不準確之處

延伸閱讀

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