



A Chronicle from the Eye of the Storm: Impact of the Coronavirus Pandemic on the Cremona's Hospital

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Abstract

Objective: To draw an accurate picture of the condition of the Cremona public Hospital from February 21st to April 20th 2020, in particular the Emergency Unit management of the Coronavirus pandemic.

Design: A retrospective analysis of data from the institutional database was conducted.

Setting: Data from the Emergency Unit of the ASST Cremona Hospital (Lombardia, Italy), a secondary level public hospital.

Patients: All the patients aged > 13 years that were admitted to the Emergency Room (ER) during the Coronavirus pandemic.

Intervention: We retrospectively analyzed the ER access records, the discharge/hospitalization reports from ER department and data from the national discharge register were analyzed by the informatic services using the Sql Oracle language.

Measurements and Main Results: From February 21st to April 20th 2020, 5078 patients were admitted to the ER at the Cremona Hospital. Out of 5078 patients evaluated, 2226 (43.8%) were hospitalized and 2852 (56.2%) were discharged. Of the 2226 patients hospitalized (average age 67.1 ± 37.4 , 1791 (76.4%) received a diagnosis of SARS-CoV-2 infection. 1198 hospitalized patients received a diagnosis of SARS Covid interstitial pneumonia. The average stay in ER was 771 ± 919 min for patients who have subsequently been hospitalized, while the patients discharged had an ER stay of 465 ± 808 min. The total COVID positive patients' deaths, hospitalized through the ER, were 333, equal to the 19.6% of the total admissions from ER.

Conclusion: ER team has put together all the competences and abilities to exploit the limited resources available, in order to better manage the emergency.

Keywords: COVID 19; Emergency Room; Interstitial Pneumonia; Cremona; SARS

Introduction

The coronavirus disease 2019 (COVID-19) is the first decisive health challenge that mankind is facing in the XXI century, with virtually every country affected and a constant increase in new COVID-19 cases worldwide.

Italy has had 223095 confirmed cases according to the last report by the Istituto Superiore di Sanità (May 15th 2020) and 29884 deaths [1]. During the pandemic emergency our national health sy-

stem was extremely strained in the capacity to effectively respond to the needs of those who were infected and required admission to the Emergency Room for Covid disease, largely due to SARS-CoV-2 pneumonia.

Cremona was one of the first cities hit by the Covid emergency and the local healthcare professionals had to face an increased, often unmanageable workload as they strive to find ways to compensate for the absence of adequate treatment, employing every

resource to contain the spread and reduce the number of victims caused by SARS-Cov-2.

The objective of this study was to draw an accurate picture of the condition of the Cremona public Hospital from February 21st to April 20th 2020. In particular our aim was to briefly report the experience of the Emergency Room and the lessons learned during this crisis.

Materials and Methods

A retrospective analysis of data from the institutional database was conducted.

All the patients aged > 13 years that were admitted to the Emergency Room (ER) during the Coronavirus pandemic emergency were included in the analysis.

The diagnostic criterion for a confirmed case was the laboratory confirmation of virus causing COVID-19 infection [2]. Our institution adopted the viral genome research via Real-Time-reverse-transcriptase Polymerase Chain Reaction (RT-PCR). Patients with a negative response were considered Covid free.

The ER access records, the discharge/hospitalization reports from ER department and data from the national discharge register were analyzed by the informatic services using the Sql Oracle language.

We considered Covid related Hospitalization all the patients with one of the following diagnosis encoded in the national discharge register: "079.82 SARS - Coronavirus associate", "480.3 - Polmonite da SARS - Coronavirus associate", "V01.82 Esposizione a SARS-Coronavirus associate",

Results

From February 21st to April 20th 2020, 5078 patients were admitted to the ER at the Cremona Hospital. Considering the same timeframe in 2019, the ER records showed 9361 patients admitted (less 43% admissions). Out of 5078 patients evaluated, 2226 (43.8%) were hospitalized and 2852 (56.2%) were discharged vs respectively 1685 (18%) and 7676 (82%) in 2019. Of the 2226 patients hospitalized (average age 67.1 ± 37.4, 1791 (76.4%) received a diagnosis of SARS-CO-V2 infection. Out of the 2852 patients discharged at home, 2031 (71.2%) were negative at the nasopharyngeal swab, while the remaining 821 had a positive test. The average stay in ER was 771 ± 919 min for patients who have subsequently been hospitalized, while the patients discharged had a ER stay of 465 ± 808 min. The average patients' stay after medical evaluation was 595 ± 758 min for the hospitalized patients and 351 ± 749 for discharged patients, with an average waiting time to be examined by the ER doctor of 174 ± 396 min for the hospitalized patients and 114 ± 174 min for the discharged patients. Table 1 shows the distribution of patients stays per months.

Timeframe	Destination	Average ER stay (± SD) min	Average stay after medical evaluation (± SD) min	Average Waiting time to be examined by the ER doctor (± SD) min
February 21 st - 28 th	Hospitalized	694 ± 882	555 ± 778	139 ± 250
	Discharged from ER	606 ± 1157	481 ± 1134	124 ± 155
March 1 st - 31 st	Hospitalized	912 ± 988	699 ± 808	213 ± 467
	Discharged from ER	471 ± 750	341 ± 661	130 ± 209
April 1 st - 20 th	Hospitalized	380 ± 509	298 ± 417	82 ± 159
	Discharged from ER	370 ± 524	274 ± 453	86 ± 138
TOT	Hospitalized	771 ± 919	595 ± 758	174 ± 396
	Discharged from ER	465 ± 808	351 ± 749	114 ± 174

Table 1: Distribution of patients stays per months.

Out of 1701 hospitalized patients with SARS-CO-V2 infection diagnosis, 1198 (70.4%) received a diagnosis of interstitial pneumonia average age 66.1 ± 36.7 years (vs 201 interstitial pneumonias in 2019 same period, average 61.2 ± 32.4 years).

The patients hospitalized were admitted in two different areas: 1400 low risk patients (82.4%) in the medical area and 301 intermediate - high risk patients (17.6%) in the critical area; out of the 301 critical patients, 27 (8% of the total) were admitted to the intensive care unit and 274 (91%) to the sub-intensive area (pneumology, internal medicine and the emergency department). The average number of daily patients hospitalized affected by Covid 19 was 28.4 patients/day (out of 37.1 patients/day vs 28.1 in 2019). The patients hospitalized were treated with medical therapy according with the institutional protocol and in particular oxygen therapy in case of respiratory failure. For 899 hospitalized patients (52.9%), O2 Therapy with ventimask or non-rebreather mask was sufficient.

47.1% of the patients admitted underwent to non-invasive or invasive ventilation and invasive, according to the clinical picture, the chest CT and the ratio P/F. Among these, 501 (38.1%) Non-invasive Ventilation (NIV) patients were subjected to 301 patients (11.6%) invasive ventilation with orotracheal intubation (IOT).

The total COVID positive patients' deaths, hospitalized through the ER, were 333, equal to the 19.6% of the total admissions from ER; the average age at death was 78.7 years ± 8.7 years). 286 patients (86%) died in the critical area.

Discussion

We evaluated the impact of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic on our secondary referral center in Cremona. We showed net lower admission to the Emergency Room than data from the corresponding period in 2019 (less 4823 accesses). The rate of hospitalization was higher than the previous year for the clinical conditions of patients and

the need for oxygen therapy (43.8% in 2020 vs 18% in 2019). The shortage of hospital beds, due to the acute disproportion between the number of patients to be hospitalized and the hospital beds, increased the average stay in the ER, from February to March (+23.9% from 694 ± 882 to 912 ± 988 min), causing considerable discomfort for patients and for ER professionals: they had to manage the medium-term assistance of all patients awaiting hospitalization. The ER team has put together all the competences and abilities to exploit the limited resources available, in order to better manage the emergency, respecting the good clinical practice need to take care of the patient and his dignity. Due to the contemporary elevated number of patients needing hospitalization, the hospital has been progressively organized, firstly increasing the number of in-hospital beds in critical and medical areas, then progressively switching the surgical departments (such as general surgery, neurosurgery, urology, gynecology and orthopedics) in Covid wards.

1198 hospitalized patients received a diagnosis of SARS Covid interstitial pneumonia (plus 589% compared to 2019); the principal issue in these patients was the acute respiratory failure management, with severe cases already at the first evaluation in ER, with the need of an immediate non invasive ventilation, even more tragically in 27 cases it was necessary to hospitalize the patients directly to the ICU for intubation. Similarly to the disproportion between hospital beds - patients, we also had to face the disproportion between patients requiring non invasive ventilation/orotracheal intubation - number of available ventilators. This difficulty has been overcome only thanks to the purchase of new ventilators thanks to the charity of Cremona's province citizens.

Data from the national register [3], showed a dramatic local (Cremona's district) increase in mortality in March, plus 391% than the same period in 2019 (Figure 1); we experienced 333 deaths in patients with COVID disease, equal to the 19.6% of the total admissions from ER; the average age at death was 78.7 years ± 8.7 years). 286 patients (86%) died in the critical area.

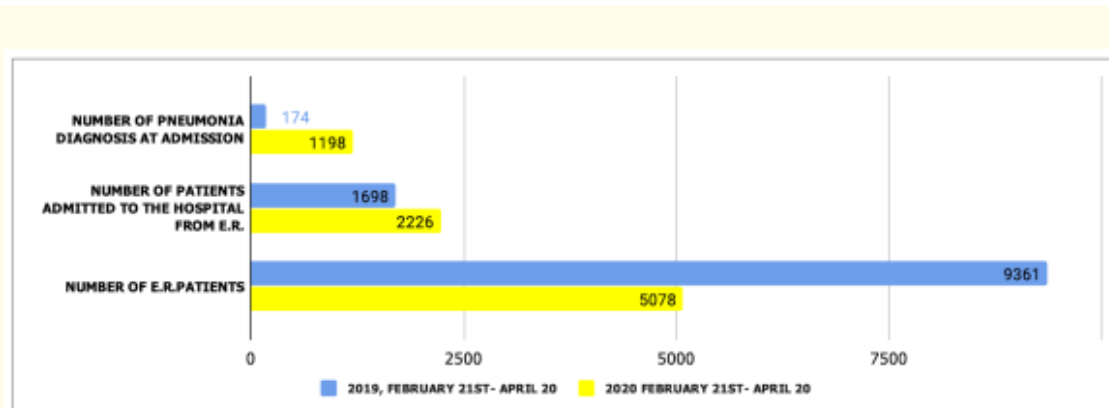


Figure 1: Differences between 2019 – 2020.

Conclusion

The experience gained during the pandemic emergency in Cremona has highlighted how the Emergency Room has been the fulcrum of the emergency management, modulating the hospital resources and adapting them to the needs that progressively the healthcare personnel had to face.

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