

Impact of COVID-19 outbreak on emergency surgery and emergency department admissions: an Italian level 2 emergency department experience

Editor

The Italian COVID-19 pandemic somewhat foreshadowed and preceded by several weeks what the rest of the world is experiencing at the present time.

With the purpose of preventing a healthcare system overload and limiting or somewhat minimizing the likelihood of a far-reaching viral transmission, on 9 March 2020 the Italian Government imposed several lockdown restrictions comprising social distancing, school closures and interruption of non-essential services¹.

The extensive lockdown restrictions paired with the widespread hospital fear experienced by most patients, contributed to discourage access to emergency departments all over the country, especially for those conditions perceived as minor²⁻³.

We investigated whether and how access to the emergency department (ED) and urgent surgical activities were

affected by the COVID-19 outbreak during the 2-month national lockdown. This study was conducted in a level 2 Accident and Emergency Department of a University Hospital in Rome, Italy which was repurposed as a 'COVID hospital' through reorganisation of infrastructures and healthcare personnel reallocation to COVID-19-dedicated wards.

Data regarding patients who had access to the surgical ED were retrospectively collected. Examined time-periods included a 'Pre-COVID-19 Era' (i.e. 9 March-3 May 2019) and a 'COVID-19 Era' considered as the period of national lockdown (i.e. 9 March-3 May 2020). Records of consecutive emergency surgical procedures and total ED admissions before and during COVID-19 outbreak were collected. Data were analysed by Levene's test for homogeneity of variance and *t*-test. Linear regression analyses were performed and results presented as beta coefficients with 95 per cent CI.

Table 1 illustrates the total number of admitted patients to the surgical ED in the analysed periods. There

was a significant decrease in overall ED admissions ($P < 0.0001$) and a substantial reduction in all-specialty surgical consultations ($P < 0.0001$), with the exception of thoracic surgery ($P = 0.196$). Eighty-eight patients were operated during the 'pre-COVID-19 era' and 16 patients during 'COVID-19 era' ($P < 0.0001$). Comorbidity burden was similar between groups ($P = 0.202$). Nevertheless, a raised incidence of postoperative complications ($P = 0.002$) and deaths ($P < 0.0001$) emerged in the 'COVID-19 era' group, likely due to the greater severity of presenting surgical pathologies combined with the deferred presentation of subjects to the ED.

We demonstrate how the COVID-19 pandemic caused a major reduction of emergency surgical procedures and overall admissions to the ED. The widespread hospital fear experienced by most patients during the peak of this outbreak seems to be mainly responsible for such a significant reduction. Furthermore, the need of minimizing exposure of patients and healthcare providers to perioperative SARS-CoV-2 infection, also played a crucial role in delaying or postponing certain types of

Table 1 Total number of admitted patients to the surgical emergency department (ED) in the pre-COVID-19 and COVID-19 eras, subdivided in different surgical specialty categories. Prognosis is divided based on the level of care assigned after diagnosis (i.e. hospital admission, discharge, refusal of hospital admission, outpatient treatment, transfer to other hospitals)

| | Pre-COVID-19 Era (09/03/2019-03/05/2019) | COVID-19 Era (09/03/2020-03/05/2020) | Total % variation rate | P-value |
|----------------------------|--|--------------------------------------|------------------------|---------|
| Overall access to ED | 1603 | 189 | -88.2 | <0.0001 |
| Surgical specialty | | | | |
| General surgery | 476 | 79 | -83.4 | <0.0001 |
| Urology | 154 | 31 | -79.9 | <0.0001 |
| Orthopaedics | 814 | 58 | -92.9 | <0.0001 |
| Maxillofacial surgery | 40 | 2 | -95.0 | <0.0001 |
| Ear, nose & throat | 27 | 7 | -74.1 | <0.0001 |
| Neurosurgery | 52 | 3 | -94.2 | <0.0001 |
| Cardiac surgery | 4 | 1 | -75.0 | 0.017 |
| Thoracic surgery | 2 | 5 | +150.0 | 0.196 |
| Vascular surgery | 34 | 3 | -91.2 | <0.0001 |
| Assigned Level of Care | | | | |
| Hospital admission | 422 | 89 | -78.9 | <0.0001 |
| Discharge | 568 | 31 | -94.5 | <0.0001 |
| Hospital admission refusal | 340 | 41 | -87.9 | <0.0001 |
| Outpatient treatment | 234 | 26 | -88.9 | <0.0001 |
| Transfer to other hospital | 39 | 2 | -94.9 | <0.0001 |

urgent or emergent surgical operations which could be managed conservatively or electively, when feasible and safe for the patient.

The widespread pandemic-related reduction of patients presenting to the ED during the peak of this outbreak might result in significantly delaying time-sensitive emergency operations, which may ultimately lead to worsened prognoses and unnecessary deaths. Evaluating the probable post-pandemic cumulative effect this might cause once the pandemic is fully over, is crucial in order to determine how to reorganise EDs in the near future.




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- 1 Remuzzi A, Remuzzi G. COVID-19 and Italy: what next? *Lancet* 2020; **395**: 1225–1228.
- 2 Soreide K, Hallet J, Matthews JB, Schnitzbauer AA, Line PD, Lai PB *et al.* Immediate and long-term impact of the COVID-19 pandemic on delivery of surgical service. *Br J Surg* 2020; <https://doi.org/10.1002/bjs.11670> [Epub ahead of print].
- 3 Spinelli A, Pellino G. COVID-19 pandemic: perspectives on an unfolding crisis. *Br J Surg* 2020; <https://doi.org/10.1002/bjs.11627> [Epub ahead of print].