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Letter to the Editor

Correspondence from Northern Italy about our experience with COVID-19



Dear Editor,

Facing the emergency of COVID-19 in one of the first red zones in Italy, we would like to remark about the significant impact that this infection brought to our Departments of Pediatric Surgery/Urology in our hospital (Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milano). We hope that our message will help other hospitals facing this world emergency.

COVID-19 infection exploded in China in November 2019, becoming a pandemic infection in March 2020. The majority of the National Health Systems did not expect such a dramatic scenario, but they had to adapt their systems to this new situation. Despite a reduced number of involved patients compared to adults, COVID-19 has brought changes also in the management of the pediatric population.

Our System Before the Infection

Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico is a general hospital with an area dedicated to neonates, children, and mothers. It counts 900 beds, with a maternal area of 320 beds and 6.000 deliveries per year. All the disciplines are represented in the hospital, including transplants and trauma. There are 58 adult ICU beds and 5 pediatric ICU beds plus 23 neonatal ICU beds.

Before the infection, the Departments of Pediatric Surgery/Urology counted on average 3.000 surgical procedures in children per year, with a dedicated area of 28 beds. In the system, specialists dedicated to this assessment are 2 professors, 3 senior consultants, 4 consultants, 2 senior registrars, and 3 registrars. The Paramedic system includes 8 pediatric nurses, 7 general nurses, and 3 healthcare assistants. The departments, being in a University Hospital, count also on 3 fellows and 2 medical students. The system is also provided by dedicated anaesthetists for the area of Maternal-Children activities. All the neonatal surgical cases are admitted in a different dedicated Neonatal Department counting 58 beds (23 ICU).

The Maternal-Neonatal-Pediatric Department is one of the largest in Europe. In this department many procedures of fetal surgery are performed. In particular, in our department, the first fetal treatment of spina bifida with minimal invasive approach in Europe was performed in June 2018. It is also one of the 4 departments in Europe for fetal treatment with tracheal plug for congenital diaphragmatic hernia. It is the main Italian referral center for low urinary tract obstructions and vesico-amniotic shunting.

The following procedures are offered to neonates, infants, and children: elective surgery for major surgery or routine minor surgery, emergencies, oncology, and neonatal surgery. Patients are prepared with pre-op evaluation usually 2 weeks before the operation. Minor surgeries (65% of the procedures) are managed with day-surgery, while patients undergoing major surgery are usually admitted the day before for preparation to surgery. Major surgery records a waiting list of 35 days and a

waiting list of 8 months for minor surgery. Research represents an important area of work, because the department is part of an academic hospital. An average of 12 publications per year on H-indexed journals is recorded. Atmosphere in the department is familiar and confidential in the respect of the roles, and there are not major contrasts.

Modification of the activities

The 1st case of COVID-19 in Italy was detected on the 20th of February 2020 in a little city close to Milano. Since the beginning, restrictions were activated for the population initially by closing meeting events, then all the productive activities and shops, except for first necessity ones, such as alimentary and pharmacies. The population was invited to remain at home. On the 23rd of February, the first case was detected in Milano City. On the 20th of March, 3,275 cases were counted in the city, with a total of 19,884 all over the nation and 7,134 admitted in the hospitals of the region. On the 20th of March, 2,168 deaths were recorded. This scenario occurred in only 3 weeks. With the COVID-19 infection, all activities underwent a significant break-down.

Elective surgery in children was stopped from the 6th of March, and only emergencies were guaranteed. Our departments were completely modified, reducing the number of beds to 12 for all the pediatric surgical specialties. In the meanwhile, the oncologic gynaecological ward was unified in the same department for the remaining 16 beds. Of the 15 nurses, 9 were moved to other wards, especially to the emergency department and wards dedicated to COVID-19 patients. Part of the staff of the departments was also reallocated in non-COVID-19 wards to help the colleagues in rosters, especially for night rosters.

All the hospital was changed and re-adapted. 300 beds out of the 900 were dedicated to COVID patients (i.e., entire wards were modified to accept this type of patient). A dedicated area for COVID-19 + pregnant women was created, and dedicated delivery rooms were opened. Also dedicated spaces for positive newborns were organized in the neonatal ward. A radical modification in the layout of the hospital was also adopted, not only more wards and beds dedicated to positive patients, but mostly increasing the number of ICU beds: 45 ventilated ICU-beds, 63 non ventilated ICU beds, and 103 high-care beds. There was also creation of a separate dedicated COVID area for children with 11 beds plus 6 ICU-beds.

Of the 6 OR blocks, 5 were converted into ICU areas and at present only 1 block run as theatre in the hospital, plus an emergency theatre in the Emergency Department, both for adults and children.

All the elective procedures, both for major or minor surgery, have been cancelled, and 1 theatre per day is maintained for elective surgery that cannot be postponed such as oncology, including gynaecologic procedures. The rearrangements in the hospital are still ongoing, as we are facing everyday changes in number of contacts and positive patients in our population.

For pediatric surgery/urology, only true emergencies were guaranteed. Since the beginning of the crisis, only 4 patients with pathologies not allowing for a delay were treated (1 pelvic rhabdomyosarcoma, 2 anorectal malformations with stenotic perineal fistula, 1 severe hydro-ureteronephrosis on a solitary kidney). Interestingly, an increased rate of complicated acute appendicitis was detected probably due to delays in presentation by the patients. Parents decided to stay at home as long as possible, despite abdominal pain, due to the fear of contracting COVID-19 in the hospital. In 7 days, 3 cases of complicated appendicitis were treated, compared to an average of 5 per month during last year. Also, the average admissions in the ER were reduced dramatically, but we have no explanation for this significant change. From the beginning of the acute phase of the crisis, that we date on the 6th March, all patients who presented symptoms as fever and cough were tested for COVID-19. The ones who tested positive were discharged to home or admitted into a dedicated ward for positive COVID-19 children.

All the staff in the department wear permanent surgical masks and gloves when they care for the patients, and also parents are invited to wear surgical masks during their stay in the department. COVID-19 negative children were admitted in double rooms with the parents, and most of them remained in a single room whenever possible. Thanks to this organisation, it was possible to guarantee a COVID-19-Free area for pediatric surgical patients. In the case of positive children, PPE (Personal Protective Equipment) were increased according to the indication of the WHO to FFP2 or FFP3 masks, gloves, glasses, water proof gowns. Also parents of these patients can remain at the bed-site with FFP2 mask, gloves, and water proof gowns. All the staff in theatre were wearing the same equipment, and the OR rooms are put on negative pressure system during the procedure.

At the present time we have had only 13 children which were COVID positive, and only one of them was admitted to ICU due to febrile seizures. We also counted 3 positive newborns, admitted in a dedicated area in the neonatal ICU. All the staff dedicated in these areas wear PPE as described above. We counted also a 12% infection rate in the health workers of the hospital after 2 weeks from the beginning of the pandemic, and they have been forced to remain in quarantine at home. Because of this aspect, the atmosphere in the ward has become very unstable and full of fear.

Conclusions

It is very difficult to draw any real conclusions at this stage because the virus is still spreading in the population and probably the number will increase in the next weeks. No prediction has yet been made for the peak of the infection and the beginning of the downslope. Anyway, there are some lessons we have learned from this situation.

The virus is very infective, and despite all the precaution workers can adopt, it is spreading very quickly in the population. The main aspect is that the virus has been impacting dramatically on the normal life of the departments. Because of the necessity to adopt strategies to contain the diffusion, all surgical departments are the first to be restricted and changed. Most of the nurses have been moved to COVID-19 areas, and the majority of the OR personnel has been moved to the ICU due to the increase in ventilated beds.

All the elective activities for a Department of Pediatric Surgery/Urology were stopped immediately. Major and minor surgical procedures

were cancelled, and the patients will be re-scheduled as soon as the crisis is over. Only emergencies or oncologic patients are maintained with a day-by-day schedule of activities. This, in our view, will be one of the more critical side effects in future activities. Because of this situation, once the normal activities re-start, the department will have to identify more surgical spaces to perform all those procedures which were cancelled during these weeks. This aspect will contrast with the fact that, by then, all the staff will be exhausted from the COVID-19 period, and it will be very difficult to ask for an increase in performance. A potential solution could be to temporarily employ medical personnel with experience in children (especially anaesthetists) to run theatres during the weekends until the waiting list will be shortened and re-balanced.

The second effect of the virus is also on financial implications. All the resources have been dedicated to fight against this unknown situation. Once the crisis is over, there will be the need for funds to reconvert the hospital to its initial status. The consequences of this will mean further reduced research funding and reduced scientific activity.

The final aspect we want to underline is the fact that this pandemic has clearly demonstrated how un-prepared we were, and the absence of real guidelines on "how to manage" this dramatic and stormy situation that each hospital has to adapt to its own infrastructures in order to achieve the maximum benefit. It remains crucial during the acute phase to stop all the elective procedures, as this reduces the number of non-infected personnel circulating in the hospital, reduces the risk of malpractice because the system is orientated on different aspects of health support, and allows the possibility to move human resources into more critical areas. In our experience, it was a great choice to rotate the workers in the hospital. This guaranteed the possibility to have a rotation of doctors and nurses in a schema of first and second lines to be utilized in the more acute phase, both for the weight of the daily job as in case of contagious spread of the personnel.

COVID-19 infection represents a huge problem for any pediatric surgical department. In addition, the stress of the "acute phase" will inevitably produce long-standing consequences not fully appreciated at the present time. In the next few months, we will eventually better understand all the negative consequences, and we will learn from our mistakes. Lessons learned should help us to avoid being unprepared in the future.

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