Giornale Italiano di Nefrologia

An account of the first hours of the Covid-19 epidemic at the Nephrology Unit in Lodi (Lombardy)

L'epidemia Covid-19: diario di bordo di una emergenza

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ABSTRACT
Marco Farina and colleagues give us their account of the first days of the Covid-19 epidemic in the Nephrology Unit of the Ospedale Maggiore in Lodi. From the news trickling through from Codogno on the 20th of February to the hospitalization, the following day, of the first dialytic patient with signs of pneumonia, who later tested positive to the virus.
They tell us of how the hospital has been completely restructured in the wake of the epidemic, at remarkable speed and providing an example for others to follow, and the great sense self-sacrifice displayed by all medical personnel. After an overview of the clinical conditions of the 7 patients positive to the virus hospitalised in the following few days, they describe in some detail how symptomatic Covid+ patients are currently managed at the Ospedale Maggiore in Lodi.

KEYWORDS: Covid-19, Ospedale Maggiore di Lodi, nephrology, dialysis

Introduction

The Covid-19 epidemic suddenly hit us on the 20th of February, the day the news started trickling through that the first case of SARS-CoV-2 had been isolated in Codogno, far out in the province. After being all over the news because of a nasty high-speed train accident only a few days before, the Lodi area was once again in the spotlight as the theatre, this time, of a health emergency.

In those first confusing hours we spent plenty of time and energy trying to find the case 1 and case 0, and doing all we could to pinpoint the starting point of the epidemic — apparently a dinner between co-workers, one of which had just returned from China. Both patient 1 and his pregnant wife, for whom we were all particularly worried, had just been hospitalised. It was then clear that the virus had arrived in Italy, in all likelihood destined to spread from our own region to the rest of the country, and that there was no point in trying to find links between infected people and China any longer. We have since been witnessing an exponential growth that, up to this day, has not shown any signs of a slowdown.

The first case

When I got to work on the 21st I was told that our Nephrology department had just received a 62-year-old hemodialysis patient showing signs of pneumonia at a chest X-rays. Showing a commendable insight, our local Health Care System had published on the 5th of February a detailed plan on how to identify, signal and manage either potential, probable or confirmed cases of Covid-19. This is not to say we were ready for what was to come – who could have been? – but at least we had criteria in place to recognise and assess the problem. The patient described above, who had arrived from the small town that would soon become the main cluster of cases in the country, was immediately isolated and we all started using the protective equipment described in detail in the management plan. We sent blood samples and a nasopharyngeal swab to the Microbiology Lab at the Sacco Hospital in Milan and we waited the results with apprehension; as it was still early days, we received them the same evening: positive. We alerted the Crisis Unit created by the Region for this purpose and, in the night between the 21st and the 22nd, the patient was transferred to the Infective Disease Unit at S. Anna Hospital in Como. He was then transferred to the Intensive Care Unit not because of any worsening of his conditions (he did not need a ventilator during transfer) but because he needed dialysis, which cannot be administered in Infective Disease wards. However, within a day, we witnessed a sudden worsening of the patient's respiratory conditions (something we have grown accustomed to seeing in this type of patients), followed by death. This announcement, that reached our Nephrology Unit through mainstream news channels, was met with bewilderment: we all knew that the patient, albeit young, had several comorbidities but we were nonetheless greatly distressed to learn of his death; as a pre-emptive measure we had to quarantine the entire medical personnel, as the very first contacts with the patient had, quite understandably, taken place without the necessary protections.

Re-structuring the Hospital

This is our account of the first hours of this ordeal; the rest, the local and national directives that have been published in quick succession and that keep being fine-tuned hour by hour, is well known to all of us. From the creation of the "red zone" in Lodi, later extended to the entire Lombardy area, to the strict quarantine measures required across the entire Region (DPCM 21 February, 8 March and 11 March, respectively).

Since the spike in the infection rate has started (as we write there has been no inversion in this trend, and we wait for it anxiously) our Hospital in Lodi has undergone a complete overhaul and its

re-structuring has been used as a model by other institutes. On the 26th of February the "blue area" was created, with 18 hospital beds previously belonging to Neurology, to hold Covid+ patients necessitating ventilation; on the 28th the "yellow area" was opened, allowing for 37 additional beds for Covid+ patients without the need for ventilation or simply requiring oxygen therapy. On the 4th of March we opened an "orange area" (previously General Medicine) with 38 more beds; on the same date we started setting up a hemodialysis room devoted to patients positive to Covid+. On the 6th we opened, within Nephrology, a "red area" with 13 beds and a drywall-delimited space devoted exclusively to the dressing and undressing of healthcare personnel. On the 7th of March Covid+ pneumonia cases started being hospitalised in the Orthopedics Unit, under supervision of the surgeon.

Doctors and nurses have been assigned to any type of duty according to pressing and ever-changing needs, impossible to predict. At the helm, a multi-disciplinary team composed by the Directors of critical care, resuscitation, pneumology and infectiology and by a number of nurses; working closely with the Biochemical and Microbiology Labs, they constituted the Hospital's Crisis Unit, gathered in a virtually permanent assembly. Everybody has been displaying a great sense self-sacrifice, working incredibly long shifts, often in silence. This same situation seems to repeat in most of Lombardy, but also in Veneto and in many other places.

Other cases

By looking at preliminary data, we clearly have yet to see the huge wave of hospitalizations described by initial projections (this, however, may change or might have already changed since I wrote this piece). Patients arriving from the "red zone" have been immediately treated with the utmost care and attention, and all necessary protections have been used both in local health care facilities and in hospitals. Those of them needing dialysis have been treated in a separate room, used exclusively to this purpose, and they have been closely monitored through anamnesis and the measuring of saturation and body temperature. Of the 18 tests administered to all patients who had been in contact with the first Covid+ case deceased at S. Anna Hospital only 3 turned out positive (about 15%); the rate is actually unexpectedly good, although in the present situation it is very difficult to make any statements with an acceptable degree of confidence.

As I write, there are 7 dialytic patients who resulted positive to SARS-CoV-2, although this number is certainly destined to go up; as we have a total of 162 patients in hemodialysis or peritoneal dialysis, the current number of infections accounts for around 4%. In addition to the case described above, where the patient was initially in good conditions but presented several comorbidities, 2 more have died. An 84-year-old patient, also with many underlying conditions, that had been hospitalized for other reasons but started testing positive during his hospital stay; X-rays showed signs of pneumonia, to be added to a recent diagnosis of pulmonary neoplasms. Then a female patient with stage 5 kidney disease who was not in dialysis but presented severe cardiac problems. She also caught the infection during the hospital stay; palliative care was the only viable option, as general conditions were already heavily compromised.

In the table below we try to summarise the clinical characteristics and outcomes of the patients who tested positive to the virus, while we wait to be able to collect and publish more precise data.

Case	Age (years)	Years of dialytic treatment (years)	Comorbidities (#)	ACE-i	ARB	Test for SARS-CoV-2	Pneumonia	Fever	Niv	Outcome*
1	62	7	C; I; N; DL	No	No	+	Sì	Sì	No→Sì	+ in III g
2	64	4	C; I; V; DL	No	No	+	Sì	Sì	No	
3	83	6	D; I	No	No	+	Sì	Sì	No	
4	84	0.5	C; I; N; DL	No	No	+	Sì	Sì	No	+ XI g
5	89	4	C; I; D; DL	No	Sì	+	Sì	Sì	Sì	
6	73	5	C; I	Sì	No	+	?	Sì	No	Transf. to CR
7	76	6	C; I	No	Sì	+	Sì	Sì	No	

C = cardiopathy; I = ipertension; N = neoplasms; D = diabetes; O = obesity; V = vasculopathy; DL = dyslipidemia.
(*) Outcome on the day of testing

Table I: Clinical characteristics and outcomes of patients positive to the virus

Addendum and conclusions

We have been the first to be hit by the epidemic and, as such, we have also been the first to put in place stringent protocols and regulations. Although we have been doing our absolute best, there is sometimes a mismatch between the regulations and the actual situation on the ground. Until now, all nurses have been using FFP2 masks, counted and distributed at the beginning of the shift. Nurses assisting the dialysis of patients that are not confirmed cases wear single use garments and, in one of the two centers in the “red area”, also a waterproof vest. All nurses wear a hat and, since the FFP2 mask can be an obstacle to the use of the visor, we have equipped each room with goggles that are sanitized with 70% alcohol at the end of each shift. Leaving aside the FFP2 mask and the waterproof vest, these are for the most part standard sanitary measures.

Patients, on the other hand, wear a chirurgical mask that is changed at the beginning of each new shift. Most of them also use it during transportation, although it is probably the same one they were given the night before. While waiting, all patients are invited to stand at least a meter apart from each other and wash thoroughly their hands and the arm where the vascular access is located.

To date, at our Hospital in Lodi, patients testing positive to the virus and showing symptoms are treated in one of the following ways (as decided by the multidisciplinary team we have previously described):

1. If invasive ventilation is needed, they are transferred to Intensive Care, where CRRT or hemodialysis is started immediately; a portable osmosis filtration system is also available.
2. If non-invasive ventilation is needed, they are transferred to the “yellow area”, where CPAP is available, as well as water filtration systems.
3. Regardless of ventilation needs they can also be assigned to the “red area” created within our Nephrology, where we have 3 rooms with 3 beds each that have also been fitted with systems to filtrate water.

We have very recently implemented a new water management system that allows for two patients to undergo dialysis at the same time. Together with the system available in the yellow area, which caters for one patient at the time, is therefore possible to dialyse 3 patients at the time, maintaining the ratio between nurses and patients to 1:3.

If the patient is a suspected case but has no symptoms, the hemodialysis can be carried out in a hospital room specifically set up for this purpose. It now has 2 beds that could easily become 6

with very minor changes to the set-up.

All considered, the system we have put in place seems currently up to the task. However, as the epidemiological landscape keeps changing, this evaluation could suddenly turn out to be wrong.