

The Greek Response to COVID-19: A True Success Story from an IBD Perspective

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Background: After the first case of infection with the novel coronavirus, SARS-CoV-2, in China, an outbreak rapidly spread, finally evolving into a global pandemic. The new disease was named coronavirus disease 2019 (COVID-19) and by May 10, 2020, it has affected more than 4 million people worldwide and caused more than 270,000 deaths.

Methods: We describe the Greek experience regarding the response to COVID-19, with particular focus on 2 COVID-19 reference hospitals in the metropolitan area of Athens, the capital of Greece.

Results: The first case of SARS-CoV-2 infection in Greece was reported on February 26, 2020, and prompted a decisive response from the Greek government. The primary focus was containment of virus spread, considering shortage of ICU beds. A general lockdown was implemented early on, and the national Health Care System underwent massive re-structuring. Our 2 gastrointestinal (GI) centers, which provide care for more than 1500 inflammatory bowel disease (IBD) patients, are located in hospitals that were transformed to COVID-19 reference centers. To maintain sufficient care for our patients, while also contributing to the fight against COVID-19, we undertook specific measures. These included provision of telemedicine services, electronic prescriptions and home delivery of medications, isolation of infusion units and IBD clinics in COVID-free zones of the hospitals, in addition to limiting endoscopies to emergencies only. Such practices allowed us to avoid interruption of appropriate therapies for IBD patients. In fact, within the SECURE-IBD database, there have been only 4 Greek IBD patients, to date, who have been reported as positive for SARS-CoV-2.

Conclusion: Timely application of preventive measures and strict compliance to guidelines limited the spread of COVID-19 in Greece and minimally impacted our IBD community, without interfering with therapeutic management.

Key Words: Greece, SARS-CoV-2, COVID-19, IBD

“Not many days after their arrival in Attica, the plague first began to show itself among the Athenians. It was said that it had broken out in many places previously in the neighborhood of Lemnos and elsewhere; but a pestilence of such extent and mortality was nowhere remembered.”

—Thucydides, History of the Peloponnesian War, Book 2. 47

On February 26, 2020, a 38-year-old woman from Thessaloniki, the second largest city in Greece, tested positive for SARS-CoV-2, becoming the first case reported in our country. From that moment, COVID-19 ceased to be an “outside” problem, and the danger for large-scale spread of the virus became an imminent reality, especially after community-acquired cases began to accumulate. Furthermore, the fact that Case 1 had just visited Northern Italy brought

up worrisome associations and generated fear that Greece may experience a health system adversity similar—or even worse—than what our neighbors were already experiencing. Like their ancestors described in the works of Thucydides the historian, Greeks, and in particular Athenians, who constitute almost 40% of the population, were once again facing the threat of a contagious agent.

PREPARING FOR THE BATTLE (THE “PEOPLE FIRST” DOGMA)

These fears were by no means unsubstantiated. First, it was only a few months ago that Greece overcame a decade of austerity, only recently freed from the suffocating supervision by the International Monetary Fund and European Union financial institutions, and once again, was experiencing economic growth. During the previous decade, the old and fragile national health system (NHS) faced considerable shrinkage due to prolonged lack of funding and almost zero renewal of retired personnel that ultimately led to a severe shortage of physicians and nurses. Relevant to the ensuing crisis, there was an extraordinarily small number of intensive care unit (ICU) beds, which did not exceed 1000 in both the public and private sectors at the beginning of the crisis.¹ With a demonstrated proportion of ICU admissions between 5% and 12% of the total positive SARS-CoV-2 cases,^{2,3} the number of cases had to remain as low as possible for the situation to be manageable.

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- Second, Greece is the second European country with the largest aging population, a problem which has intensified by the massive immigration of young people in search for employment in other countries, along with a drop in births due to reluctance of young couples to create families that they cannot subsequently support. As a result, a large proportion of the population fell into the high-risk group for adverse outcomes from COVID-19.⁴ To make things worse, a majority of elderly people live with younger members of their families, as traditional Greek culture supports a multigenerational way of life within the home. In the Athenian democracy, an old man could take his son(s) to the Supreme Court (Areios Pagos) for not supporting him. To this day, sending parents to nursing homes is a devastating stigma for their descendants in Greek communities. Now with the virus knocking on their doors, these family strongholds could easily be transformed to fatal transmission routes for frail elderly.
- Third, scattered across the country are communities of people with particular characteristics, like the Roma, or overcrowded refugee and immigrant camps on islands packed with vulnerable people in poor sanitation conditions and inadequate health care. Such uncontrolled areas could easily act as infectious nests, thus posing additional threats for the unrestrained spread of the virus.
- Finally, there is always the “Greek factor.” Greeks are rebellious by nature and hold an inherent inclination to question the good intentions of the state and disobey commands from the authorities. Those almost “heritable” traits were exaggerated during the financial crisis and the hardships that Greek people have gone through. More importantly, the timing could not be worse. After a 10 year recession, finally some light was beginning to shine at the end of the tunnel, and prosperity was a realistic goal for many. Retreating back to a new financial nadir was a particularly cruel request for this nation and could elicit a largely unpredictable resistance to comply with any central plan.

For all these reasons, when it became apparent that Greece would not be spared by SARS-CoV-2, the question of “people vs the economy” was not theoretical but a purely practical one. It was perceived by both the newly elected government and the people as the sacrifice of “our vulnerable, elderly parents” to support the fragile economy of a country that had just got back on its feet. And as selecting economy would have shaken the very foundation of our society, the decision of “people first” was the only true choice.

By early March, high-ranking officials clearly realized that if the demand from the NHS was on the same scale as Italy, the system would collapse instantly with devastating consequences. As such, a plan for proactive measures was immediately implemented and coordinated by a Coronavirus Task Force, consisting of a Scientific Committee (SC) and the Department of Civil Protection (CP). The SC monitor the evolution of the pandemic locally and internationally and advise on the potential health risks and actions to be taken. An appointed deputy minister of the CP was given the power to intervene, without facing barriers from any other authority. On February 27, 2020, with only 3 confirmed cases, all “large scale” events were cancelled across the country. On March 10, 2020,

still without any deaths reported, the operation of educational institutions at all levels was suspended. By March 16, 2020, all cafés, restaurants, bars, museums, shopping centers, sports facilities, and retail stores were closed down. Finally, on March 22, 2020, Greek authorities announced a general lockdown. All nonessential movement throughout the country was prohibited, flights to and from affected countries were cancelled, returning travellers were checked for SARS-CoV-2 and put under quarantine for 14 days, and stringent stay-at-home and social distancing policies were implemented. Communities, villages, small towns, and even counties were proactively quarantined to avoid wider spread of the virus when incident cases of COVID-19 were diagnosed, and extensive search of the area population was performed by trained staff of EODY (the Greek CDC). The public was informed daily on national TV networks on any recent developments regarding the pandemic and provided with regular updates concerning support measures for life during lockdown.

Although these measures had definitely slowed down the spread of the pandemic, still, by late March, with the number of cases exceeding 1000 and 32 COVID-19-related deaths, there was still one valid question: would the NHS hold up to the increasing pressure?

FIGHTING THE BATTLE (ORGANIZING AND OPERATING COVID-REFERENCE HOSPITALS)

“It is right to endure with resignation what the gods send, and to face one’s enemies with courage.”

—Thucydides, History of the Peloponnesian War, Book 2. 64

Sotiria General Hospital is located within the Athens metropolitan area. It was established in 1902, and until 1936, it exclusively operated as a sanatorium for the treatment of patients with tuberculosis. Later on, the hospital functioned as a pure pulmonary-focused institution, until 1950, when it was transformed to a general hospital. Sotiria Hospital possesses some unique features that made it a perfect fit to be selected as the primary reference center for COVID-19 patients during the pandemic. First, the hospital structure consists of 34 separate buildings, which are completely isolated from each other and spread throughout a wooded area covering more than 50 acres. This configuration creates the perfect opportunity for eliminating intrahospital spread of SARS-CoV-2 by departmental isolation. Second, medical personnel mainly includes pulmonary medicine specialists, who are highly qualified to fight COVID-19, which primarily affects the lungs. Third, there are 3 separate ICUs in the hospital, facilitating movement of patients between ICUs and regular wards. Fourth, Sotiria served as the reference hospital in Greece during the SARS and MERS epidemics and gained experience in global health crises. Finally, the hospital lacks great variety in nonpulmonary medical specialties, allowing fast and effective restrictions or total

shutdown of the other departments. Therefore, the decision was made that the main battle against COVID-19 for Athens, where the majority of cases were reported, would take place at Sotiria Hospital.

An immediate plan was set in motion.

- First, a massive reorganization of the existing infrastructure was needed, with the primary goal of completely separating COVID-19-free and COVID-19-involved areas. This was to start from the Emergency Department (ER). On March 17, 2020, with only 387 confirmed cases and 5 deaths reported, the ER began to accept only suspicious or confirmed cases of SARS-CoV-2. This was essential, as separation into COVID-19 and non-COVID-19 emergencies would have been too complex, and most probably ineffective, given the large number of visiting patients, small size of waiting rooms, common delays before examination for milder cases. Thus, appropriate distancing would have been practically impossible.
- Second, a strict definition and separation of COVID-19-free and COVID-19-exposed personnel and buildings had to be applied. The majority of the medical wards became exclusive COVID-19-operating units, including all the ICUs of the hospital. The surgical ward was shut down, as there were no admissions from the ER. However, a single building with the Internal Medicine and Pulmonary Medicine Departments was maintained COVID-19-free to provide care for patients with chronic diseases. The Gastrointestinal Unit, which also serves a population of more than 400 IBD patients, is also stationed there, as it is a large infusion center for oncological and immunological intravenous therapies. All personnel, including doctors, nurses, paramedical specialties and volunteers, were strictly split into those working exclusively in COVID-19-operating or COVID-19-free areas.
- Third, for all this to work, we needed an adequate pool of medical, nursing, and paramedical staff who had to be trained through a fast-track process. To increase the number of people, the majority of doctors and nurses were allocated to COVID-19-clinics, with additional personnel either transferred from other hospitals or recruited with short-term contracts and further supported by an impressive response from volunteers. For training, educational meetings were arranged, and electronic distribution of updated information and published guidelines were done regularly. Practice sessions were arranged for health care personnel to understand the importance and proper use of protective measures and equipment. Last, but not least, a system of psychological support from experienced professionals was put into place to support all medical workers who were seriously affected by exhaustion and fear, particularly when newly infected or hospitalized colleagues were identified.⁵
- Finally, crowding within the hospital was minimized. All hospital workers who could work from home were obligated to do so. Outpatient clinics and services were either shut down or served only emergencies. One of the hardest parts was the prohibition of all visitations to patients by family members. Given the strong family bonding of Greeks, prohibiting family members from caring for their loved ones, especially when critically ill or dying, was among the most disheartening tasks. Finally, our hospital also has 2 academic departments, which, when fully operational, teach more than 150 medical and nursing students, and these also had to be shut down.

Although Sotiria was the central reference hospital for COVID-19, a successful outcome could not be achieved by changes made at a single institution. The involvement of Evagelismos Hospital, which is the largest health institution in the country, was absolutely critical for sharing the burden of the pandemic. For Evagelismos Hospital, radical changes took place immediately, which required great effort and discipline, given its size and wide departmental variability. Outpatient clinics shut down, only emergency surgeries and endoscopic procedures were performed, 2 COVID-19 departments were deployed with reallocation of medical and nursing staff, and the Advanced Care Unit was instantly transformed into an ICU to be added to the other 2 existing ICUs. The Accident & Emergency Department was entirely rearranged to cover COVID-19 suspected and confirmed cases, not withholding the activities of a hospital that continued to be on call every day to serve patients with diseases other than COVID-19. Similar changes took place at several academic and public hospitals across the country, depending on the local burden of the pandemic, whereas a few small hospitals shut down all activities to admit COVID-19 patients, exclusively.

CUTTING OUR LOSSES (PROVIDING CARE TO IBD PATIENTS WITHIN COVID-REFERENCE CENTERS)

After the designation of our hospitals as COVID-reference centers, demanding problems arose abruptly, which called for instantaneous solutions in regards to IBD patients that are registered in our departments. Collectively, our departments provide health care to approximately 1500 IBD patients via open access to outpatient IBD clinics and/or referrals from other hospitals. Hundreds of IBD patients receive intravenous therapies in shared or autonomous infusion units. The shutdown of outpatient services and the transfer of several GI specialists to the frontline of operations against COVID-19 generated a pressing need to find alternative ways to communicate with our patients⁶ and maintain adequate follow-up of their condition in the absence of physical contact. We followed the guidelines that have been published by several international IBD-organizations.⁷⁻⁹ Accordingly, we have implemented a series of telemedicine tools to sustain communication with our patients.¹⁰ Thus, a Facebook page was created, the emailing list of our patients was updated, reference e-mail was opened to provide advice and guide laboratory tests, and an open phone support line was initiated. These measures provided us with the ability to communicate with our patients and provide them with all the mandatory advice and information for the development of the pandemic. In addition, we were also informed about the well-being of patients, we followed up on their condition, and we introduced treatment adjustments when it was deemed necessary. Another set of measures was applied to

ensure that home confinement of IBD patients, particularly those on immunomodulatory treatments, would not be interrupted. A system of remote electronic prescriptions was initiated by the government and a network of state employees, volunteers, and pharmaceutical companies facilitated home delivery of subcutaneous biologics. Updated information regarding the impact of the COVID-19 pandemic on IBD was regularly published on the website of the Greek IBD Patient Association.

In line with published guidelines and expert opinions, we decided not to stop any necessary therapy in our patients.¹¹ Thus, we had to keep our infusion center open and functional during the pandemic, while at the same time ensuring the safety of our patients. To achieve this goal, we had to modify our routine and introduce multiple safety points along the way. The infusion centers are located in the COVID-19-free building of our hospitals, and the personnel who work there are not involved in activities on the COVID-19-exposed areas. Screening of patients for COVID-19-related events and/or symptoms are communicated both via telephone the day before the visit and before entering the infusion center. Accompanying persons are not allowed to enter the infusion area, and appointments are evenly spread throughout the days and weeks to avoid contact. Infusions are accelerated when possible, and general safety instructions are followed by both patients and medical staff (eg, distance between patients, protective masks, and hand sanitation).

At the time of publication of this article, there are only 4 cases of Greek patients with IBD in the SECURE-IBD database, two of whom are followed in our centers.¹² The first case is a patient who lives in a rural area of Greek Macedonia, which showed high infectious rates for COVID-19. The patient was on long-term anti-TNF therapy. He has since recovered uneventfully after a mild course of the infection. The second was a middle-aged patient with Crohn's disease and ankylosing spondylitis, who was admitted with moderate COVID-19 while being under treatment with infliximab and methotrexate. This patient received treatment for COVID-19, *Clostridioides difficile*, and nutritional therapy. He too recovered from the infection and on the day before discharge from the hospital received his regular infusion of infliximab.

A LOOK TO THE FUTURE

"... and have benefited the state more by their public services than they have injured her (Athena) by their private actions."

—Thucydides, History of the Peloponnesian War, Book 2. 42

It is truly astonishing that Greeks set aside the usual conspiracy theories and abided by the rules. This is in part due to the solid efforts of the SC and CP committees, who focused more on rational arguments than fear of death. The rapidly evolving success of lockdown in a country that is "used to being perceived as a problem child" in the European Union has

further fueled national pride and enhanced public discipline and efforts to flatten the curve of COVID-19 cases in Greece.¹³ The relentless fight of health care personnel, the devotion and solidarity of all essential workers who keep the country running and support those in isolation, the warm weather, and other as yet unknown factors have all succeeded to bring the pandemic under control.

On May 10, 2020, 6 new COVID-19 cases were reported, with only 30 COVID-19 patients treated in ICUs. The country has counted 150 deaths from COVID-19, an astonishing number, considering the population of Greece, with the basic reproduction number (R0) now being at 0.40. This has led to the gradual and cautious reopening of hospitals. At Evangelismos Hospital, the Endoscopy and Surgical Departments reopened on May 6, 2020, and outpatient clinics started booking appointments again; COVID-19 departments were closed, and staff underwent real-time polymerase chain reaction tests to return to their posts, as there were only 4 hospitalized COVID-19 patients. Sotiria Hospital, which will remain the core central reference COVID-19 hospital, will treat all remaining COVID-19 patients and maintain a fully functional COVID-19 building as a safety net for any unexpected second wave. However, full operational status as a general hospital is expected by early June. Patients transferred to the E&A departments are selectively tested for the virus by a rapid PCR-test, and if negative and carry no other risk factors for COVID-19, they are admitted to regular wards. Inpatients are also tested before they undergo surgery and/or endoscopy, although a 10-day period without fever is also a prerequisite for outpatients before GI endoscopy, in addition to safety tips mentioned previously. Infusion units in our hospitals maintain all the preventive measures. As antibody tests of reliable sensitivity and specificity are not yet available for massive screening of the population for past COVID-19 infection and the level of immunity of the population is virtually projected by epidemiological models, groups of trained staff of the Greek EODY are currently performing extensive molecular tests to identify infected people in target groups, including particular minorities, schools, prisons, and geographical areas with an unusual higher rate of infection. The plan is to combine molecular tests with antibody screening in the near future.

Small businesses reopened on May 6, 2020, and high school seniors returned to their classrooms on the May 11, 2020. People are allowed to travel in different areas of the same prefecture/district but not yet between counties. If within 2 weeks the situation remains stable, further restrictions will be lifted, including free travel, opening of markets, and all high school classes will resume. Hope has been raised that travel, both by air and by sea, will resume in the near future and Greeks will be able to enjoy summer holidays. Furthermore, there is some light at the end of the tunnel that the steam-engine of our economy, tourism, will regain some foreign markets if and when international travel restrictions are lifted for travel to Greece.

REFERENCES

1. Rhodes A, Ferdinande P, Flaatten H, et al. The variability of critical care bed numbers in Europe. *Intensive Care Med.* 2012;38:1647–1653.
2. Grasselli G, Pesenti A, Cecconi M. Critical care utilization for the COVID-19 outbreak in Lombardy, Italy: early experience and forecast during an emergency response. *JAMA.* 2020.
3. Wu Z, McGoogan JM. Characteristics of and important lessons from the Coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72314 cases from the Chinese Center for Disease Control and Prevention. *JAMA.* 2020.
4. Zheng Z, Peng F, Xu B, et al. Risk factors of critical & mortal COVID-19 cases: a systematic literature review and meta-analysis. *J Infect.* 2020.
5. Blake H, Bermingham F, Johnson G, et al. Mitigating the psychological impact of COVID-19 on healthcare workers: a digital learning package. *Int J Environ Res Public Health.* 2020;17.
6. Hong Z, Li N, Li D, et al. Telemedicine during the COVID-19 pandemic: experiences from Western China. *J Med Internet Res.* 2020;22:e19577.
7. Hanzel J, Ma C, Marshall JK, et al. Managing inflammatory bowel disease during COVID-19: summary of recommendations from gastrointestinal societies. *Clin Gastroenterol Hepatol.* 2020.
8. Kennedy NA, Jones GR, Lamb CA, et al. British Society of Gastroenterology guidance for management of inflammatory bowel disease during the COVID-19 pandemic. *Gut.* 2020;69:984–990.
9. Rubin DT, Abreu MT, Rai V, et al.; International Organization for the Study of Inflammatory Bowel D. Management of patients with Crohn's disease and ulcerative colitis during the COVID-19 pandemic: results of an International Meeting. *Gastroenterology.* 2020.
10. Occhipinti V, Pastorelli L. Challenges in the care of IBD patients during the CoViD-19 pandemic: report from a "Red Zone" area in Northern Italy. *Inflamm Bowel Dis.* 2020;26:793–796.
11. Allocca M, Fiorino G, Furfaro F, et al. Maintaining the quality standards of care for inflammatory bowel disease patients during the COVID-19 pandemic. *Clin Gastroenterol Hepatol.* 2020.
12. www.covidibd.org. Accessed 26 May 2020.
13. <https://www.nytimes.com/2020/04/28/world/europe/coronavirus-greece-europe.html>. Accessed 26 May 2020.