SPECIAL ARTICLE

Activity of Spanish gastroenterology units before and after the COVID-19 pandemic: an assessment using the EFIC_AD tool, developed by the Sociedad Española de Patología Digestiva (SEPD)

Elvira Poves[1], Fernando Carballo[2], Daniel Ceballos[3], Fernando Alberca[4]

[1]Department of Digestive Diseases. Hospital Universitario Príncipe de Asturias. Alcalá de Henares, Madrid. Spain. [2]Department of Internal Medicine. Universidad de Murcia. Murcia, Spain. [3]Department of Digestive Diseases. Hospital Universitario de Gran Canaria Doctor Negrín. Las Palmas de Gran Canaria, Las Palmas. Spain. [4]Department of Digestive Diseases. Hospital Clínico Universitario Virgen de la Arrixaca. Murcia, Spain

Received: 27/07/2023 · **Accepted:** 09/08/2023

Correspondence: Elvira Poves Martínez. Department of Digestive Diseases. Hospital Universitario Príncipe de Asturias. Ctra. de Alcalá-Meco, s/n. 28805 Alcalá de Henares, Madrid. Spain. **e-mail:** epoves5@gmail.com

Activity of gastroenterology departments during the COVID-19 pandemics: evaluation using the EFIC_AD tool

Study population

Up to 42 gastroenterology care units (UAAD)

Methods

Descriptive study, 2019-2021

EFIC_AD registry of activity of Spanish gastroenterology care units

Activity in hospital admissions, clinic visits, endoscopic procedures, and non-endoscopic tests

Outcomes

Reduced primary activity by 1/3 in 2020

Recovery only partial in 2021

Poves E, et al.

Revista Española de Enfermedades Digestivas (REED)
The Spanish Journal of Gastroenterology

Lay summary

The impact of the COVID-19 pandemic on specific activity at Spanish gastroenterology care units (UAAD) in 2020 is described by means of assessment using EFIC_AD (Eficiencia en Aparato Digestivo, into Spanish), an instrument developed and provided to UAAD by the Sociedad Española de Patología Digestiva (SEPD). Overall, UAAD activity markedly decreased in 2020 from the pre-pandemic level; this decrease was particularly pronounced in clinical visits and endoscopy procedures, where reductions by over one third took place. Activity only partially recovered in 2021.

REV ESP ENFERM DIG 2023;115(11):636-643
DOI: 10.17235/reed.2023.9860/2023

ABSTRACT

Introduction: the COVID-19 pandemic had a strong impact on the healthcare model. The Sociedad Española de Patología Digestiva (SEPD) offered gastroenterology care units (UAAD) an instrument (EFIC_AD) to record and analyze their efficacy and efficiency. Thus, the impact of the pandemic on the activity of UAAD was assessed.

Methods: a descriptive study, based on the EFIC_AD registry for the period 2019-2021, of activity regarding admissions, clinic visits, and endoscopic as well as non-endoscopic tests, and endoscopy room performance.

Results: data were collected from up to 42 hospitals (22 with ≥ 500 beds). Overall, activity during 2020 compared to 2019 decreased by 12.30 % for admissions and 40 % for pH-metries (16.70 % for new clinic visits; 14.34 % for referrals from primary care; 24.70 % for gastroscopies; 32.50 % for colonoscopies; 31.00 % for endoscopic ultrasounds; 18.20 % for endoscopic retrograde cholangiopancreatography (ERCPs); 38.00 % for manometries; 23.60 % for abdominal ultrasounds; 36.17 % for liver transient elastographies [Fibroscan®]). The levels achieved during 2019 were not fully recovered during 2021 except for digestive motility studies, and virtually for endoscopy room performance rate (88.15 % in 2019; 67.77 % in 2020; 85.93 % in 2021).

Conclusions: during 2020 the COVID-19 pandemic led to a markedly decreased in specific activities at UAAD, which was not fully recovered in 2021 despite endoscopy room performance return to normal.

Keywords: EFIC_AD tool. COVID-19. Digestive system. Spain.

INTRODUCTION

On January 30, 2020 the World Health Organization (WHO) declared the outbreak of a new coronavirus (2019-nCoV), initially identified in the People's Repulic of China in December 2019, a public health pandemic of international concern (1), the declaration remaining in force till May 5, 2023 (2). In Spain, the national epidemiological surveillance network *(Red Nacional de Vigilancia Epidemiológica,* RENAVE) issued their first COVID-19 report on February 11, 2020, when only two cases had been confirmed in our country (3). Since then, until March 28, 2022, six epidemic periods were identified in Spain, which led to the implementation of a new epidemiological surveillance strategy establishing a restriction for epidemiological diagnosis, including all suspect cases in individuals aged 60 years or older, as well as hospitalized patients regardless of age (4). Particularly during 2020, but also during 2021, all national healthcare resources were dramatically compromised, thus testing the resilience of our national health system *(Sistema Nacional de Salud,* SNS) (5). At the end of 2021 a total of 6,128,902 COVID-19 cases had been reported in Spain — 447,287 required hospitalization (43,663 in an ICU), with a then recorded mortality of 89,319 people (6), which provides an idea of the magnitude of the healthcare problem being tackled.

Unsurprisingly, the heavy burden of COVID-19 also had a strong impact on Spanish gastroenterology care units (*unidades asistenciales de aparato digestivo*, UAAD) (7), forcing a redirection of their usual care activities to meeting pandemic-driven needs.

The Sociedad Española de Patología Digestiva (SEPD), as the scientific society involved in the gastroenterology field, promotes research and the use of the best knowledge available not only in clinical practice but also healthcare management. Its management and quality committee (*Comité de Gestión y Calidad*) develops initiatives for improving healthcare quality and optimizing UAADs (8), including a definition of the specialty's portfolio, of standards and markers for endoscopy procedures, and of excellence certification processes for UAADs. Developments also include the *Recursos y Calidad en Aparato Digestivo* (RECALAD) project (9,10), based on exploiting the minimum basic dataset (*conjunto mínimo básico de datos*, CMBD) at a national level and on obtaining structural data from UAADs by means of direct surveys to their heads. Directly related with this original, the SEPD offered those same unit heads the instrument *Eficiencia en Aparato Digestivo* (EFIC_AD) (11,12), which allows assessing, sharing, and comparing information necessary for UAAD management (benchmarking) using routine information systems. This project was started in 2018 and is currently ongoing.

The present study is aimed at describing changes in Spanish UAAD care activities and performance during the COVID-19 pandemic. This description is based on the analysis of available records using the EFIC_AD instrument over the period 2019-2021.

METHODS

Design

A descriptive study was performed based on the EFIC_AD SEPD registry (11,12), which collects activities from UAADs: hospitalization, clinic visits, and both endoscopic and

Conflict of interest: the authors declare no conflict of interest.

Author contributions: conceptualization: Elvira Poves, Daniel Ceballos and Fernando Alberca. Research process: Elvira Poves, Daniel Ceballos and Fernando Alberca. Formal analysis: Elvira Poves, Daniel Ceballos and Fernando Alberca. Data management and storage: Sociedad Española de Patología Digestiva (SEPD). First original paper: Elvira Poves, Fernando Carballo, Daniel Ceballos and Fernando Alberca. Review and editing: Elvira Poves, Fernando Carballo, Daniel Ceballos and Fernando Alberca. Methodology: Elvira Poves, Daniel Ceballos and Fernando Alberca. Funding: Sociedad Española de Patología Digestiva (SEPD). Administration: Sociedad Española de Patología Digestiva (SEPD). Resources: Sociedad Española de Patología Digestiva (SEPD). Software: Sociedad Española de Patología Digestiva (SEPD). Supervision: Elvira Poves. Visualization: Sociedad Española de Patología Digestiva (SEPD).

Poves E, Carballo F, Ceballos D, Alberca F. Activity of Spanish gastroenterology units before and after the COVID-19 pandemic: an assessment using the EFIC_AD tool, developed by the Sociedad Española de Patología Digestiva (SEPD). Rev Esp Enferm Dig 2023;115(11):636-643

DOI: 10.17235/reed.2023.9860/2023

non-endoscopic procedures. The tool associated with this registry allows reporting on markers such as health care work pressure according to population numbers, outpatient clinic scheduling, endoscopy room performance, distribution of practitioners among care areas, or overall performance of unit members. Enrolled UAADs provide annual information, using a REDCap questionnaire (13), about global hospital data, human resources available to units, and data on activities regarding hospitalizations, clinic visits, and both endoscopic and non-endoscopic tests. In order to estimate activity performance a work group at SEPD defined time standards for the various provisions involved (Table 1).

The study period includes the years 2019, 2020 and 2021, with the first of these being considered the baseline reference for comparisons in assessing changes attributable to the COVID-19 pandemic.

All UAADs included in the study are in hospitals with referral areas and, therefore, with assigned populations. The participating hospitals per year, as well as their main characteristics, are listed in table 2.

The variables considered included: hospital type (≥ 500 beds; < 500 beds), number of specialists per 100,000 inhabitants (taking 35 h per week as reference for work hours), number of hospital admissions per 10,000 inhabitants, new patients among all clinic visits per 10,000 inhabitants, gastroscopies, colonoscopies, endoscopic retrograde cholangiopancreatographies (ERCPs), endoscopic ultrasounds, endoscopic treatments, manometries, pH-metries, ultrasonograms, and hepatic transient elastography (HTE) tests using Fibroscan®, all of them per 10,000 inhabitants. Percent decreases in activity for 2020 compared to 2019 were calculated, as were endoscopy room performance rates for all three study years.

Statistical analysis

This was a descriptive study of the characteristics and activity of the participating hospitals, and descriptive variables, absolute and relative frequencies (percentage) and means were used. For comparison of some data between centers frequentation rates per population number were used, based on the referral area population. Activity differences between series are also described as percentages with no statistical comparisons performed, given the differences in hospital samples for each study year. REDCap (SEPD) and Microsoft Excel 2010 were used for the study.

Ethical aspects

No information directly from patients was included in the study. The records containing the data from the various sites are centralized in the SEPD for joint analysis, and hospital-specific reports as well as access to itemized information are exclusively available to each site.

Table 1. *Duration standards—in minutes, including sedation and report writing—provided by the Sociedad Española de Patología Digestiva (SEPD) and assigned to the various gastroenterology portfolio provisions in the EFIC-AD tool*

Hospitalization	Min.	Endoscopic procedures*	Min.	Non-endoscopic procedures	Min.
Admission	45	Gastroscopy	30	Capsule endoscopy	105
Stay	30	Gastroscopy with submucosal dissection	120	Esophageal manometry	60
Consultation request form	30	Gastroscopies with other therapy	45	Anorectal manometry	30
Clinic		Percutaneous gastrostomy	50	24-hour PH-metry	30
New (monographic)	30	Colonoscopy	45	Complete abdominal ultrasound	25
Review (monographic)	20	Colonoscopy with polypectomy	60	Contrast-enhanced abdominal ultrasound	35
New (hospital)	20	Colonoscopy with submucosal dissection	120	Intestinal ultrasound	35
Review (hospital)	20	Colonoscopy with other therapy	60	Endoanal ultrasound	20
New (specialty center)	20	Rectosigmoidoscopy	30	Abdominal ultrasound with FNA	40
Review (specialty center)	20	ERCP	90	Percutaneous liver biopsy	45
		Enteroscopy	120	Hepatic transient elastography using Fibroscan®	20
		Upper GI endoscopic ultrasound	60	Hepatic hemodynamic study	120
		Upper GI endoscopic ultrasound with FNA	80		
		Upper GI endoscopic ultrasound with therapy	120		
		Lower GI endoscopic ultrasound	30		

DOI: 10.17235/reed.2023.9860/2023

Table 2. *General characteristics of participating hospitals*

	Year		
	2019	2020	2021
Total number of participating hospitals (n)	30	40	42
Hospital size according to number of beds (n)			
< 500 beds	10	18	18
≥ 500 beds	20	22	24
Population in the referral area (mean)			
< 500 beds	187,892	178,254	188,261
≥ 500 beds	386,859	381,808	373,958
University hospital (n/%)			
< 500 beds	8 (80 %)	12 (67 %)	12 (67 %)
≥ 500 beds	20 (100 %)	22 (100 %)	24 (100 %)
Hospital with gastroenterology training (MIR) (n/%)			
< 500 beds	6 (60 %)	9 (50 %)	9 (50 %)
≥ 500 beds	20 (100 %)	22 (100 %)	24 (100 %)
Hospital with on-site on-call gastroenterology service (n/%)			
< 500 beds	4 (40 %)	7 (39 %)	7 (39 %)
≥ 500 beds	15 (75 %)	15 (68 %)	15 (63 %)

RESULTS

In 2019 data were collected from 30 hospitals (20 with ≥ 500 beds), in 2020 from 40 (22 with ≥ 500 beds), and in 2021 from 42 sites (22 with ≥ 500 beds). All of them are public institutions with referral areas, and differences between larger and smaller sited include their portfolios, which in the latter include provisions of referral to other healthcare areas. The complete list of participating hospitals may be seen at the end of the present manuscript, and their geographical distribution across autonomous communities is depicted in figure 1.

Regarding each UAAD's overall activity, in 2019 the time distribution by areas was 36.35 % for clinic visits, 34.88 % for endoscopic procedures, 24.13 % for hospitalization, and 4.64 % for non-endoscopic testing.

The number of specialists per 100,000 inhabitants remained stable over the 3 years, oscillating between 5.90 and 6.02 for hospitals as a whole (Fig. 2).

The number of hospital admissions per 10,000 inhabitants fell in UAADs by 12.30 % for all hospitals overall, whereas mean stay for those admissions showed no relevant changes (Fig. 2).

Outpatient activity declined in 2020 by 16.70 % for new patients, the impact being greater on smaller hospitals (< 500 beds); activity decreased by 28.50 %, this reduction being greater at the expense of non-monographic visits and for hospitals with fewer than 500 beds (Fig. 2). The ratio of subsequent to initial visits was 2.81 in 2019, 3.12 in 2020 and 2.91 in 2021. Referrals from primary care decreased for all hospitals as a whole by 14.34 % in 2020, the impact being stronger on smaller hospitals, where they decreased by up to 26.60 %. In 2021, with the pandemic still ongoing, referrals remained also less common than in 2019 (Fig. 2).

As regards the most common endoscopic procedures, gastroscopies diminished in 2020 by 24.70 % amongst all hospitals (with a maximum of 56 %) and colonoscopies by 32.50 % (max. = 66 %), with activity failing to recover to baseline levels even in 2021 (figure 3). A drop in complex examinations was also recorded in 2020, by 31.00 % for endoscopic ultrasound and 18.20 % for ERCP (Fig. 3).

Functional testing decreased in 2020 by 38.00 % for manometry and 40.00 % for pH-metry, and then returned to 2019 levels in 2021 (Fig. 3).

Ultrasound scans decreased in 2020 by 23.60 %, and HTE-Fibroscan® by 36.17 % (Fig. 3).

Table 3 shows the percent decreases in activity from 2019 to 2020, which range from 12.30 % for hospital admissions to 40 % for manometries.

Endoscopy room performance in 2019 was 88.15 % (n = 16 hospitals), and declined to 67.77 % (n = 16) in 2020, with recovery to 85.93 % in 2021.

Fig. 1. *Geographic distribution of participating hospitals.*

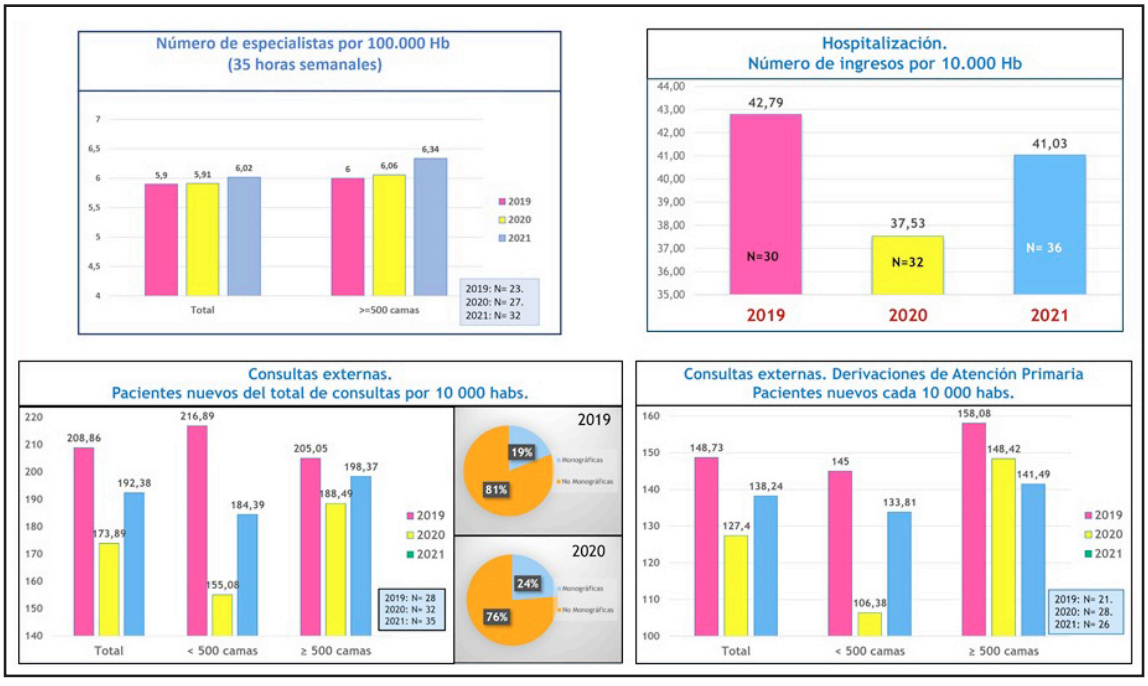

Fig. 2. *Main results for number of specialists, admissions, and clinic visits.*

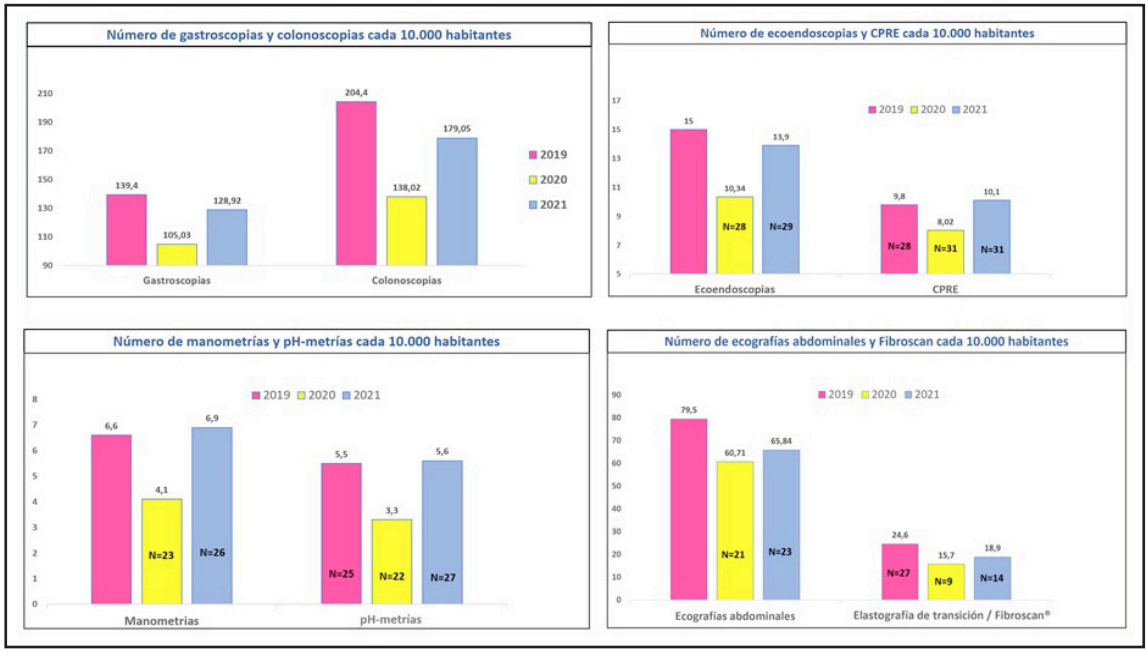

Fig. 3. *Main results for endoscopic and non-endoscopic procedures.*

Table 3. *Percent decreases in activity as recorded in 2020 compared to 2019*

Activity	Decrease (%)
Admissions	12.30
New patients from clinics	16.70
Referrals from primary care	14.34
Gastroscopies	24.70
Colonoscopies	32.50
Echoendoscopies	31.00
ERCP	18.20
Manometries	38.00
pH-metries	40.00
Abdominal ultrasound scans	23.60
Hepatic transient elastography using Fibroscan®	36.17

DISCUSSION

Resource availability, reorganizational capacity, and professional commitment were key in responding to the pandemic. Health care costs during the COVID-19 period were highly relevant and significantly higher than usual (14), albeit net benefits related to health may have been positive (15). Whether initial resource availability was adequate, that's entirely another matter; from a professional's perspective that was not the case; its inadequacy -- deemed to result from prior austerity policies – was considered to be responsible for staff recheduling needs directed to provide care for COVID-19 patients at the expense of normal activity (16). Indeed, thanks to the organizational skills of centers and the excellent response obtained from their staffs an effective, adaptive response was ultimately mounted to the unparalleled increase in medical care the COVID-19 pandemic brought about (17).

Digestive manifestations in COVID-19 patients are not among those with the greatest impact on health care, hence gastroenterology is among the specialties that were severely affected by a reduction in normal activity in order to contribute to the general care of infected patients.

According to the study data, in 2019 over 70 % of the time schedule for overall activity was devoted to clinic visits and endoscopy procedures, 25 % to hospitalization, and slightly less than 5 % to non-endoscopic tests. The latter percentage is logically higher in UAADs with digestive tract ultrasonography units when compared to those that have such examinations performed by radiology departments.

The results obtained in 2020 clearly describe a significant decrease in activity at work areas within Spanish UAADs. Hospitalization adjustments simply reflected the then-existing workload, with a decrease in care for digestive tract diseases, which were relegated because of the COVID-19 avalanche; even the possibility should be considered that part of the admissions formally attributed to UAADs over this period were in fact unrelated to gastrointestinal disease but were performed by gastroenterologists within the framework of COVID-19-associated activity, hence the decrease in caring for inpatients with digestive tract conditions may be even higher.

The reduced number of new outpatients may be attributed not only to shifting in in-hospital specialist care but also – and notably so – to collapsed primary care, with fewer patient referrals. The decrease was more pronounced in smaller hospitals and non-monographic clinics, thus reflecting efforts to maintain an adequate care for patients with severe chronic conditions such as, for instance, inflammatory bowel disease (18,19), where novel telematic strategies were often successfully used (20,21), a path also taken by other specialist UAADs that was amenable to optimization and adaption after the pandemic, as has been the case with hepatology (22). However, despite efforts, the pandemic had no doubt a strong negative impact on the physical and mental health status of patients with complex digestive system conditions, as are liver transplant recipients (23).

As expected, endoscopic activity dropped significantly. This decrease could have been partly managed by improving indication appropriateness (24), but diagnosis was simply delayed on other occasions. Particularly relevant is the case of gastrointestinal tumors, specifically colon cancer (25), where new diagnoses decreased by up to 48 % (26), with estimations of up to 83,000 patients affected in Europe within two months after pandemic onset (27). Consequently, stages were more advanced at clinical identification, and a smaller number of elective surgeries were performed (28), which sits on top of a virtual standstill of screening programs (29). Similarly, a worsening of prognoses with more advanced stages has been documented for pancreatic cancer patients (30). According to our data, endoscopic activity in terms of procedure numbers could not be fully resumed in 2021, despite the recommendations and contingency plans that were developed (31-33), including complex procedures such as endoscopic ultrasound. However, endoscopy room performance was virtually recovered in full in 2021, a clear reflection of the efforts made. Baseline levels also failed to be recovered for number of non-endoscopic studies such as abdominal ultrasounds and HTE with Fibroscan®, but recovery was achieved for gastrointestinal motility tests (manometries and pH-metries), an area where specific recommendations were also established (34). A reasonable explanation of this fact is the highly specialized nature of gastrointestinal motility units and their comparatively lower volume of testing.

In summary, on the whole, overall UAAD activity in Spain dramatically dropped in 2020 from its pre-pandemic baseline, especially in clinic visits and endoscopy procedures with reductions by over one-third, without full recovery in 2021.

This study has a number of limitations, particularly from a sampling perspective, given the voluntary application of sites to the registry, but also because of its being a descriptive study based on a registry that was not specifically designed to assess the COVID pandemic impact. These limitations preclude reliable comparisons between centers or estimates of effectiveness for the measures eventually taken in response to the huge health issue being confronted. However, this did not prevent us from ensuring objectivity in the data collected, which allows a useful approach to

activity and performance monitoring of Spanish UAADs. In our case, it helps in describing and understanding the adjustments implemented by these units during the COVID-19 pandemic, showing that its outbreak entailed a substantial decrease in gastroenterology specialist care activities, with impacts as significant as delays in the diagnosis of digestive cancer or the virtual standstill of screening programs. Notwithstanding this, UAADs and their specialist units knew how to protect health care, as much as possible, for highly dependent chronic patients by successfully incorporating telematic alternatives.

KEYPOINTS

– The COVID-19 pandemic led to a significant decrease in specific activities at Spanish gastroenterology care units (UAAD).

– The SEPD EFIC_AD instrument represents a useful tool in monitoring care activities at clinical departments.

ACKNOWLEDGEMENTS

We are grateful to all members in the original SEPD Work Group (Conrado Fernández Rodríguez, Javier de Teresa Galván, Ángel Caunedo Álvarez, Senador Morán Sánchez, Rafael Gómez Rodríguez, Joaquín Hinojosa del Val, Javier Júdez Gutiérrez) for their contribution to designing and implementing the EFIC_AD project.

Those reponsible for and working at the various gastroenterology care units (UAAD) that took part in the study, whose efforts and committment underlie the results obtained and to whom the present project is dedicated.

To the SEPD for their consistent institutional support, with special thanks to Arantxa Perales García for her technical support.

LIST OF PARTICIPATING HOSPITALS

Complejo Asistencial, Segovia. Complejo Asistencial Universitario (CAU), León. CAU, Palencia. Complejo Hospitalario (CH), Ourense. CH, Toledo. Complejo Hospitalario Universitario (CHU), Albacete. CHU, Pontevedra. CHU, Vigo. CHU Insular Materno-Infantil, Las Palmas de Gran Canaria. Consorci Sanitari, Terrassa. Consorcio Hospital General Universitario (HGU), Valencia. Hospital (H) Arnau de Vilanova, Valencia. H Comarcal, Melilla. H Comarcal del Noroeste, Caravaca de la Cruz. H de Mérida, Mérida. H de Urduliz, Urduliz. H Infanta Cristina, Parla. H de Medina del Campo, Medina del Campo, Valladolid. H Morales Meseguer, Murcia. H Rafael Méndez, Lorca, Murcia. Hospital Clínico Universitario (HCU), Santiago de Compostela. HCU Virgen de la Arrixaca, Murcia. HGU, Castellón. HU del Henares, Coslada, Madrid. HGU Gregorio Marañón, Madrid. HGU Santa Lucía, Cartagena, Murcia. Hospital Universitario (HU) 12 de Octubre, Madrid. HU, Basurto. HU, Álava. HU, Guadalajara. HU, Jerez. HU de La Princesa, Madrid. HU del Bierzo, Ponferrada, León. HU del Sureste, Arganda del Rey, Madrid. HU del Tajo, Aranjuez, Madrid. HU Fundación Alcorcón, Alcorcón, Madrid. HU La Paz, Madrid. HU Lucus Augusti, Lugo. HU Marqués de Valdecilla, Santander. HU Príncipe de Asturias, Alcalá de Henares, Madrid. HU Ramón y Cajal, Madrid. HU Severo Ochoa, Leganés, Madrid. HU Virgen de la Macarena, Sevilla. HU Virgen de las Nieves, Granada.

REFERENCES

1. World Health Organization (WHO). Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV). Geneva: WHO; 2020. Disponible en: https://www.who.int/news/item/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-(2019-ncov)

2. World Health Organization (WHO). Statement on the fifteenth meeting of the IHR (2005) Emergency Committee on the COVID-19 pandemic. Geneva: WHO; 2023. Disponible en: https://www.who.int/news/item/05-05-2023-statement-on-the-fifteenth-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-coronavirus-disease-(covid-19)-pandemic

3. Red Nacional de Vigilancia Epidemiológica (RENAVE). Primeros casos investigados en España por COVID-2019. Informe COVID-2019 n.o 1. Red Nacional de Vigilancia Epidemiológica. RENAVE; 2020. Disponible en: https://www.isciii.es/QueHacemos/Servicios/VigilanciaSaludPublicaRENAVE/EnfermedadesTransmisibles/Documents/INFORMES/Informes%20COVID-19/Informe%20COVID-19.%20N%C2%BA%201_11febrero2020_ISCIII.pdf

4. Red Nacional de Vigilancia Epidemiológica (RENAVE). Informe n.o 176. Situación de COVID-19 en España. Informe COVID-19. RENAVE; 2023. Disponible en: https://www.isciii.es/QueHacemos/Servicios/VigilanciaSaludPublicaRENAVE/EnfermedadesTransmisibles/Documents/INFORMES/Informes%20COVID-19/INFORMES%20COVID-19%202023/Informe%20n%C2%BA%20176%20Situaci%C3%B3n%20actual%20de%20COVID-19%20en%20Espa%C3%B1a%20a%2021%20de%20abril%20de%202023.pdf

5. Legido-Quigley H, Mateos-García JT, Campos VR, et al. The resilience of the Spanish health system against the COVID-19 pandemic. Lancet Public Health 2020;5(5):e251-e2. DOI: 10.1016/s2468-2667(20)30060-8

6. Red Nacional de Vigilancia Epidemiológica (RENAVE). Informe n.o 111. Situación de COVID-19 en España. Informe COVID-19. 29 de diciembre de 2021. RENAVE; 2022. Disponible en: https://www.isciii.es/QueHacemos/Servicios/VigilanciaSaludPublicaRENAVE/EnfermedadesTransmisibles/Documents/INFORMES/Informes%20COVID-19/INFORMES%20COVID-19%202021/Informe%20n%C2%BA%20111%20Situaci%C3%B3n%20de%20COVID-19%20en%20Espa%C3%B1a%20a%2029%20de%20diciembre%20de%202021.pdf

7. Crespo J, Fernández Carrillo C, Iruzubieta P, et al. Massive impact of coronavirus disease 2019 pandemic on gastroenterology and hepatology departments and doctors in Spain. J Gastroenterol Hepatol 2021;36(6):1627-33. DOI: 10.1111/jgh.15340

8. Sociedad Española de Patología Digestiva (SEPD). Gestión y calidad. SEPD; 2023. Disponible en: https://sepd.es/inicio_gyc

9. Sociedad Española de Patología Digestiva (SEPD). Proyecto RECALAD. SEPD; 2023. Disponible en: https://sepd.es/proyectos/14

10. Fernández Rodríguez CM, Fernández Pérez C, Bernal JL, et al. RECALAD. Patient care at National Health System Digestive Care Units - A pilot study, 2015. Rev Esp Enferm Dig 2018;110(1):44-50DOI: 10.17235/reed.2017.5316/2017

11. Sociedad Española de Patología Digestiva (SEPD). Proyecto EFIC_AD. SEPD; 2023. Disponible en: https://sepd.es/proyectos/15

12. Poves E. Ponencia sobre qué es EFIC-AD. Sociedad Española de Patología Digestiva (SEPD); 2020. Disponible en: https://www.youtube.com/watch?v=GdlTNp9nIDE

13. Harris PA, Taylor R, Minor BL, et al. The REDCap consortium: building an international community of software platform partners. J Biomed Inform 2019;95:103208. DOI: 10.1016/j.jbi.2019.103208

14. Álvarez-Del Río B, Sánchez-de Prada L, Álvaro-Meca A, et al. Economic burden of the 2020 COVID-19 hospitalizations in Spain. JAMA Netw Open 2023;6(1):e2250960. DOI: 10.1001/jamanetworkopen.2022.50960

15. Thom H, Walker J, Vickerman P, et al. Exploratory comparison of Healthcare costs and benefits of the UK's COVID-19 response with four European countries. Eur J Public Health 2021;31(3):619-24. DOI: 10.1093/eurpub/ckab019

16. Otero-García L, Mateos JT, Esperato A, et al. Austerity measures and underfunding of the Spanish Health System during the COVID-19 pandemic-perception of healthcare staff in Spain. Int J Environ Res Public Health 2023;20(3). DOI: 10.3390/ijerph20032594

17. Artiga-Sainz LM, Sarria-Santamera A, Martínez-Alés G, et al. New approach to managing the COVID-19 pandemic in a complex tertiary care medical center in Madrid, Spain. Disaster Med Public Health Prep 2022;16(5):2097-102. DOI: 10.1017/dmp.2021.63

18. Carpio López D, Martínez Pillado M, Salgado Barreira Á, et al. Effectiveness of the contingency plan of the internal inflammatory disease unit before COVID-19 infection. Rev Esp Salud Publica 2020;94.

19. Martín Arranz E, Suárez Ferrer C, García Ramírez L, et al. Management of COVID-19 pandemic in Spanish Inflammatory Bowel Disease Units: results from a national survey. Inflamm Bowel Dis 2020;26(8):1149-54. DOI: 10.1093/ibd/izaa142

20. El Hajra I, Calvo M, Santos Pérez E, et al. Consequences and management of COVID-19 on the care activity of an Inflammatory Bowel Disease Unit. Rev Esp Enferm Dig 2021;113(2):98-102. DOI: 10.17235/reed.2020.7543/2020

21. Del Hoyo J, Millán M, Garrido-Marín A, et al. Changes in the management of IBD patients since the onset of COVID-19 pandemic. A path toward the implementation of telemedicine in Spain? Gastroenterol Hepatol 2022;45(9):697-705. DOI: 10.1016/j.gastrohep.2021.08.006

22. Crespo J, Cabezas J, Mateo Soler M, et al. Current state of telemedicine in the field of Hepatology in Spain: challenges, threats and next steps to follow for an intelligent digital transformation. Rev Esp Enferm Dig 2023;115(5):248-58. DOI: 10.17235/reed.2022.8918/2022

23. Cuadrado A, Gaite LM, Odriozola A, et al. Impact of the COVID-19 lockdown on liver transplant recipients. A single center observational study. Rev Esp Enferm Dig 2022;114(8):448-54. DOI: 10.17235/reed.2021.8173/2021

24. Díez Redondo P, Núñez Rodríguez MH, Fuentes Valenzuela E, et al. Evaluation of endoscopy requests in the resumption of activity during the SARS-CoV-2 pandemic: denial of nonindicated requests and prioritization of accepted requests. Rev Esp Enferm Dig 2020;112(10):748-55. DOI: 10.17235/reed.2020.7375/2020

25. Domper-Arnal MJ, Hijos-Mallada G, Lanas Á. The impact of COVID-19 pandemic in the diagnosis and management of colorectal cancer patients. Therap Adv Gastroenterol 2022;15:17562848221117636. DOI: 10.1177/17562848221117636

26. Suárez J, Mata E, Guerra A, et al. Impact of the COVID-19 pandemic during Spain's state of emergency on the diagnosis of colorectal cancer. J Surg Oncol 2021;123(1):32-6. DOI: 10.1002/jso.26263

27. Spinelli A, Pellino G. COVID-19 pandemic: perspectives on an unfolding crisis. Br J Surg 2020;107(7):785-7. DOI: 10.1002/bjs.11627

28. Cano-Valderrama O, Sánchez-Santos R, Vigorita V, et al. Has the COVID-19 pandemic changed the clinical picture and tumour stage at the time of presentation of patients with colorectal cancer? A retrospective cohort study. Cir Esp (Engl Ed) 2023;101(2):90-6. DOI: 10.1016/j.cireng.2022.02.017

29. Vives N, Binefa G, Vidal C, et al. Short-term impact of the COVID-19 pandemic on a population-based screening program for colorectal cancer in Catalonia (Spain). Prev Med 2022;155:106929. DOI: 10.1016/j.ypmed.2021.106929

30. Tejedor-Tejada J, Gómez-Díez C, Robles Gaitero S, et al. Impact of the SARS-CoV-2 pandemic on pancreatic cancer: diagnosis and short-term survival. Rev Esp Enferm Dig 2022;114(8):509-10. DOI: 10.17235/reed.2022.8772/2022

31. Crespo J, Andrade R, Alberca de Las Parras F, et al. Resumption of activity in gastroenterology departments. Recommendations by SEPD, AEEH, GETECCU and AEG. Rev Esp Enferm Dig 2020;112(5):397-411. DOI: 10.17235/reed.2020.7141/2020

32. Marín-Gabriel JC, Santiago ER. AEG-SEED position paper for the resumption of endoscopic activity after the peak phase of the COVID-19 pandemic. Gastroenterol Hepatol 2020;43(7):389-407. DOI: 10.1016/j.gastrohep.2020.05.004

33. Peña-Rey I, Almazán R, Rodríguez-Camacho E, et al. Resumption of endoscopy in the Galician colorectal cancer screening programme after the COVID-19 lock down: patient safety results. Rev Esp Enferm Dig 2021;113(2):119-21. DOI: 10.17235/reed.2020.7647/2020

34. Alcedo J, Serra J, Pérez de la Serna J, et al. Recommendations of the Spanish Association of Neurogastroenterology and Motility (ASENEM) to restart the activity of gastrointestinal motility laboratories after the state of alarm called due to the COVID-19 pandemic. Gastroenterol Hepatol 2020;43(8):485-96. DOI: 10.1016/j.gastrohep.2020.05.011