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COVID-19 and its Impact on GI Endoscopy Units: Perspective from a UK District General Hospital

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ABSTRACT

Objective: The impacts of COVID-19 have been far-reaching on a global scale, particularly within the healthcare sector. Here we focus on how reaction to the threat of COVID-19 has affected GI (Gastrointestinal) endoscopy services within our local Trust and anticipate the challenges in re-establishing this service as the UK eases lockdown restrictions.

Design: GI endoscopy data for the East and North Hertfordshire NHS Trust (January- July 2020) was obtained from the Trust's database: the number and type of procedure, inpatient or day case, and location. Local policy documentation, as well as published literature, was consulted regarding recent changes to practice and strategies moving forward.

Results: In April 2020, the number of GI endoscopy procedures carried out locally was 115. This is <10%of the Trust's usual monthly figures. Reasons for such a fall in numbers include: cancellation of routine procedures, resource availability (staff, equipment, facilities) and additional time per procedure. The significant reduction in activity during the 'peak phase' of COVID-19 mirrors national patterns and has seen a substantial rise in waiting list numbers. Use of alternative facilities is one strategy being employed locally to increase service capacity: 48% of procedures performed in Maywere outsourced to the independent sector.

Conclusion: The potential risk of harm through delayed diagnosis/ intervention as a result of prolonged waits for endoscopic procedures remains a feasible threat, particularly when faced with the uncertain future disease trajectory of COVID-19. Units therefore need to balance strategies to minimise COVID-19 transmission with those targeting the waiting list backlog.

KEYWORDS

COVID-19, GI endoscopy, Healthcare, Transmission

INTRODUCTION

The COVID-19 Pandemic has caused significant disruption to the way of life of large populations across the world, with over 11 million confirmed cases and over 535,000 deaths [1]. In the UK, at the time of writing, the initial 'peak' in the COVID-19 infection burden appears to have passed, and the country is in the process of making the transition out of 'lockdown'. In the healthcare setting, response to the threat of COVID-19 has resulted in the widespread re-organisation and redistribution of staff and services including GI (gastrointestinal) endoscopy [2].

GI endoscopy involves the passage of a fibre-optic device via the mouth or anus/ stoma to inspect the lining of GI tract, and perform diagnostic and therapeutic procedures. These include OGDs (oesophago-gastro-duodenoscopy), ERCPs (endoscopic retrograde cholangiopancreatography), flexible sigmoidoscopies and colonoscopies. Such procedures are associated with being aerosol generating (AGP) in a variety

of ways including intubation of the oesophagus and insufflation of carbon dioxide/ air which is later expelled from the patient [3].

Aerosols have been defined as particles smaller than 5 μm which are suspended in a gas [4]. COVID-19 is an RNA (ribonucleic acid) virus, found in high concentrations in the nasopharynx [5]. It is widely speculated that COVID-19 can be transmitted via the air through aerosol generation and droplets (larger collections of particles) as well as through contact with inanimate objects [3,4]. Thereforethere is a theoretical risk of transmission during endoscopy, particularly during UGI (upper gastrointestinal) endoscopies. In addition, evidence of RNA particles in faecal matter has raised the possibility of faecal-oral transmission [5].

GI endoscopy plays an important role in the diagnosis, monitoring and treatment of a variety of health conditions including GI cancers. During the COVID-19 Pandemic, there has been a significant reduction in the number of procedures carried out [6]. With little still known about the natural history of the disease, it is unclear as to what extent the threat of further 'surges' in COVID-19 cases will continue to affect the delivery of GI endoscopy as well as other healthcare services.

Here we present the impact that the COVID-19 Pandemic has had so far on the delivery of endoscopy services at the East and North Hertfordshire NHS Trust, a UK District General Hospital (DGH), which covers a catchment area of approximately 700,000 patients. Prior to the impact of COVID-19, the Trust was running 6 endoscopy suites: 2 at the New Queen Elizabeth II Hospital, Welwyn Garden City, and 4 the Lister Hospital, Stevenage. The Lister Hospital is the Trust's main acute site, with an Emergency Department, Critical Care Unit, and largest number of inpatient beds.

METHODS

Monthly Trust figures for GI endoscopy activity were requested from the Endoscopy Waiting List Manager for the East and North Hertfordshire NHS Trust. The following data was obtained from the Trust's endoscopy database: the total number and type of procedure, whether an inpatient or day case, and the facility location (within the Trust or outsourced to an external site). With national lockdown coming in to force on 23 March 2020 [7], the January and February figures reflect recent 'pre COVID-19' activity levelsand the April figures reflect activity during the COVID-19 'peak'. Local Departmental guidelines and planning documentation were consulted, alongsidepublished literature.

RESULTS

Local Endoscopy Unit Figures

The figures in Table 1 reveal the Trust's monthly numbers of GI endoscopic procedures between January and July 2020. 1, 410 and 1, 214 endoscopic procedures were carried out within the Trust in the months of January and Februaryrespectively. Of these, in February: 85 were inpatient (7%) and 1129 (93%) were outpatient. 6 endoscopy suites were in utilisation across the 2 Trust Hospital sites.

Following implementation of emergency rota changes in response to the COVID-19 Pandemic, only 115 endoscopic procedures were carried out in the month of April (of which 33% were outsourced) and 267 in May (of which 48% were outsourced). Of the procedures carried out at Trust endoscopy unit sites ('in-house') during April, 46 were inpatient (60%) and 31 were outpatient (40%). All endoscopic activity at the New Queen Elizabeth II Hospital ceased as the suites were repurposed for Ambulatory Emergency Care (part of the Trust's major incident restructuring in response to the COVID-19 threat). Endoscopic activity has continued at the Lister Hospital, at a much-reduced capacity. Outsourcing of procedures to date has been to Pinehill Hospital, a local Private Hospital.

DISCUSSION

Comparison of local and national figures

COVID-19 has had a significant impact on our local endoscopy service: changes to practice in response to the pandemic hasresulted in more than a 10 fold reduction in the number of procedures carried out in April compared to the months of January and February. Procedure numbers remained low in May, however capacity had doubled compared to the previous month. Our figures appear in keeping with national trends- it is estimated that during the initial 'peak' phase in the UK, total endoscopic activities were reduced to 5% of usual levels [6]. Case restriction (primarily emergency cases)appears to have been a key factor. Other contributing factors include: shortage of resources (staffing, equipment and facilities), the increased duration of time required per case (additional cleaning) and screening considerations. These are all issues that remain at the forefront when it comes to strategic planning as we transition out of lockdown coupled with the ongoing threat of future 'surges' in COVID-19 cases.

Cessation of routine/ non-urgent procedures

The main reason for the sudden drop in activity reflected in the Aprilfigures islikely to be asa result to changes in Trust Policy [8] in line with national guidance [2]. As the COVID-19 Pandemic began to take a hold in the UK, with national lockdown introduced on 23 March 2020 [7], guidance from the British Society of Gastroenterology (BSG) published 03 April 2020 was to restrict access to endoscopy to emergency/ essential procedures [2]. This is consistent with the recommendation to temporarily stop all non-urgent/elective case activity by 95% of national and international societies of Gastroenterology and GI Endoscopy, collated by Filho et al, 2020[9]. The rationale for this was to limit unnecessary potential exposure to COVID-19 through minimising the performance of AGPs, whilst limiting the potential for serious harm through delayed diagnosis/ treatment as a result of patients not being able to access endoscopy services.

Staffing levels

The two main issues affecting staffing levels are unavailability due to redeployment/ changes to normal working patterns, and unavailability due to isolation (through sickness, affected contacts, or shielding). Within our Trust during the months of April and May, medical

Table 1: Monthly endoscopy figures for East and North Hertfordshire NHS Trust for (2020) [IP = Inpatient; OP = Outpatient]

Month (2020)	Procedure												Total number across all sites per month
	OGD			Flexible sigmoidoscopy			Colonoscopy			ERCP			
	in-house		external site	in-house		external site	in-house		external site	in-house		external site	
	IP	OP	all	IP	OP	all	IP	OP	all	IP	OP	all	
January	75	412	0	17	417	0	12	451	0	17	9	0	1410
February	43	276	0	20	478	0	12	365	0	10	10	0	1214
March	44	181	0	11	269	0	8	303	0	13	8	0	837
April	30	14	11	1	8	4	0	5	23	15	4	0	115
May	36	31	18	8	8	7	1	40	104	13	1	0	267
June	33	62	10	0	24	43	3	46	109	10	4	0	344
July	1	65	0	14	54	4	8	141	87	6	7	0	387

on-call commitments of the Gastroenterologists were increased and the General Surgery Consultants were asked to manage additional ED commitments. Changes to normal rota patterns included dual consultant operating lists for the General Surgery Consultants. In addition, 15% of endoscopy nursing staff were redeployed to support the wards including the Critical Care Unit. Such restructuring was not unique to our Trust [10]. In terms of shielding and time off for sickness/contact isolation, Trust guidance was in line with national guidanceissued by the department of Health [11].

Facility availability

As mentioned previously, during the 'peak' of COVID-19, the New Queen Elizabeth Hospital endoscopy suites were repurposed for alternative services (Emergency Ambulatory Care) in line with the Trust's major incident management planning. This meant a reduction in available 'in-house' endoscopy suites from 6 to 4. However, during this time, an additional suite at an external site (Pinehill Hospital) has become available.

Equipment/ PPE (personal protective equipment)

The national shortage of PPE has been well highlighted [12]. Prior to the COVID-19 Pandemic, standard PPE for upper and lower GI endoscopy was plastic gown and gloves. However, in view of the threat of COVID-19 transmission, PPE requirements have increased to including a full waterproof gown, FFP3 (filtering facepiece respirators) level mask or equivalent hood, gloves, apron, face shield/ googles for UGI procedures equivocal to that worn in the Critical Care Unit. This is reflected in the guidance from a number of international and national societies [2]. There is some evidence to quantify how wearing enhanced PPE reduces risk of transmission; in 2008 The Health and Safety executivepublished a report comparing gross protection of surgical mask to filtering face piece respirators [13]. They demonstrated theoretically FFP3 masks provide 100-fold protection against viral particle inhalation against a simulated sneeze at 1 m. With additional PPE requirements suddenly needed across departments (particularly in Critical Care, Operating Theatres, and Emergency Department settings), it is feasible that contingency plans for rationing resource allocation were considered by some Trusts. Locally this has not been attributed to being a capacity-limiting factor thus far, but it is acknowledged as a consideration in the strategic planning moving forward [8].

Changes to decontamination procedures

Another significant change to practice as a result of efforts to minimise COVID-19 transmission is the prolonged time for suite decontamination- increasingthe amount of time between cases. This is not unique to endoscopy- many clinical areas in the hospital have been affected by the increased levels of cleaning, and time required to dry between cases- particularly in theatres [14,15]. With 20 minutes of advised 'downtime' between cases to allow for the settling of respiratory droplets and the decontamination of procedure rooms, each non-training OGD slot now assigned 40 minutes (20 minutes pre pandemic) and Colonoscopy now assigned 60 minutes (previously 40). Therefore without increasing the length of the working day, or number of lists, the capacity per list has reduced.

Increased waiting list size

One of the main challenges moving forward is to clear the backlog of pending cases on the waiting list, whilst continuing to provide appointments for new referrals. One of the first steps has been to re-instate lists (at a reduced number of 4 procedures per list) and broaden the indications to urgent and 2 ww appointments [8]. Another strategy is using alternative facilities: in May 2020,48% of all endoscopic procedures were carried out at Pinehill Hospital (private sector hospital). Although the proportion outsourcedreduced to 37% by July 2020, the total number of procedures outsourced is slightly greater (129 in May to 145 in July 2020). Moving forward, the possibility of weekend lists has been identified in the Trust's Standard Operating Procedure [8]as a means of increasing capacity. Reclaiming the 2 endoscopy suites at the New Queen Elizabeth II Hospital will also help to increase listcapacity.

Re-triaging and cancelling planned procedures/arranging alternative non-endoscopic investigations is another strategy which may reduce the volume of pending cases. Examples of alternative investigations being considered by the Trust to reduce the endoscopy waiting list size include CT (computed tomography) colonography, capsule endoscopy and the Cytosponge procedure [16]. However capacity of such procedures is also subject to restrictions- in the case of capsule endoscopy, the cost of additional training, purchasing of capsules, and CNS availability all need to be considered. In addition, concerns have been raised as to whether alternative investigations will be as safe, accurate and cost-effective as endoscopy [6]. There is a concern that such a large 'backlog' of cases may significantly delay the time to diagnosis and intervention for a number of patients, which may ultimately result in harm. Unfortunately at present, it is difficult to quantify this risk.

Screening

Screening for COVID-19 infection is another consideration. Currently our Trust is adopting the SCOTS screening method (see supplementary material 1), which takes place at least 7 days prior to the procedure (along with requesting 7 days of self-isolation) [8]. Repetition of the SCOTS questionnaire and the patient's temperature are also performed on admission. This is additional workload for staff and also runs the risk of late cancellations (for example if patients become symptomatic/ break their isolation) which may reduce the efficiency of filling lists at a time of limited capacity.

Hayee *et al*, 2020 [6] suggest a more robust screening strategy calling for subsequent risk stratification and reduction in the level of PPE requirements/other precautions in cases where patients are deemed to be COVID-19 negative. A similar policy is being considered locally for enhanced screeningat one of our Trust's sites. This would involve 72 hours testing of patients for COVID-19 infection prior to their appointment and the return of PPE-guidance and decontamination practice as per the pre COVID-19 era (increasing list capacity primarily through reducing the decontamination time between cases). However, this strategy is in preliminary stages, and requires CAG (Confidentiality Advisory Group) and IPC (Integrated Personal Commissioning) approval. At present, local policy is to consider the possibility of COVID-19 in all patients undergoing endoscopy and so full enhanced PPE requirements and other infection control precautions are similarly recommended for all cases [8].

Training

Adverse impacts on training has been highlighted as a significant issue internationally across all medical and surgical specialties- not just endoscopy [17,18]. Common practice has been to stop training lists-locally such lists were cancelled. At a time of reduced list capacity, high waiting list burden, and ongoing threat of COVID-19 transmission, re-establishing training opportunities will be challenging. Initial prioritization of colonoscopy training for those close to completion of training is likely (in keeping with the Joint Advisory Group on Endoscopic Training (JAG) Guidance [19]).

CONCLUSION

The COVID-19 Pandemic has had far-reaching impacts on many lives world-wide, particularly in the healthcare sector. Endoscopy units have seen significant changes to routine practice. Our local service has seen a dramatic reduction in total number of procedures carried out within the Trust, resulting in growing numbers of patients on waiting lists. This is not a situation unique to our Trust. Although capacity is starting to increase as the Trust enters into it's 'Restart' phase following recovery from the initial COVID-19 'peak', many unknowns remain including whether there will be subsequent 'waves' of high COVID-19 disease burden. Challenges include strategies to increase capacity whilst accommodating additional time per case, staffing availability, reliable access to appropriate PPE, screening considerations and the re-introduction of training. At the cornerstone of addressing these issues is patient safety; endoscopy units will need to urgently evaluate individual patient risk to allow appropriate selection, escalation and in some cases, cancellation of procedures, to tackle the growing waiting lists units are faced with.

STATEMENTS

Authorship: Rebecca Nunn and Shirish Tewari contributed equally to this paper in conception, data analysis, and drafting of the manuscript (joint first authors). Santhini Jeyarajah, Vivek Gupta, James Evans, Nick Reay-Jones, and Nasser Khan contributed to the planning, draft revision and approval of the final manuscript.

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SUPPLEMENTARY MATERIAL

Supplementary material 1: SCOTS Criteria for Screening Patients

Adapted from SOP Title: Phased recovery plan to increase Endoscopy activity during COVID-19 (East and North Hertfordshire NHS Trust, 2020)

Telephone Screening '***SCOTS***' Criteria

In the last 14 days, has the patient:

- Had ***S***ymptoms* suggestive of COVID-19? OR
- Come into close ***C***ontact with a known or suspected case of COVID-19

Supplementary considerations

- Does the patient's ***O***ccupation mean they have been exposed to COVID-19?
- Has the patient ***T***ravelled and returned from a known risk area?
- Is the patient in a '***S***hielded' category?

*Symptoms include: fever, new or persistent cough, myalgia, difficulty in breathing, loss of taste/ smell, nausea (or vomiting), diarrhoea, confusion, reduced mobility