Gut

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Journal:	*Gut*
Manuscript ID	gutjnl-2021-324354.R2
Article Type:	Endoscopy news
Date Submitted by the Author:	12-Mar-2021
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Keywords:	COVID-19, ENDOSCOPY

COVID-19 transmission following outpatient endoscopy during pandemic acceleration phase involving SARS-CoV-2 VOC 202012/01 variant in United Kingdom

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COVID-19; Personal Protective Equipment; Gastroenterology; severe acute respiratory syndrome coronavirus 2; Endoscopy; Outpatient; Swab; Telephone; Aerosol; SARS-CoV-2 VOC 202012/01 variant

Message

Infection prevention and control (IPC) measures put in place during the first phases of the COVID-19 pandemic were effective in reducing endoscopy-related transmission while allowing recovery of activity.

In late 2020 a novel, more infectious, SARS-CoV-2 variant (VOC 202012/01) was associated with a second 'surge' or acceleration phase in the UK. We sought to measure whether pre-existing IPC guidance would be sufficient to prevent transmission in this scenario. Prospective data were collected from eight UK centres for n=2440 procedures. Pre-endoscopy, nine (0.37%) asymptomatic patients were positive for SARS-CoV-2 by nasopharyngeal swab (NPS) testing and their procedures deferred. Post-endoscopy, thirty (1.27%) developed symptoms suspicious for COVID-19, with fifteen (0.65%) testing positive on NPS. Three (0.12%) cases were attributed to potential transmission from endoscopy attendance. All 15 patients recovered fully requiring only community treatment.

Although we report cases potentially transmitted by endoscopy attendance in this latest study, the risk of COVID-19 transmission following outpatient endoscopy remains very low. Thus, IPC measures developed in earlier pandemic phases appear robust, but our data emphasise the need for vigilance and strict adherence to these measures in order to optimally protect both patients and staff.

In more detail

The effects of the COVID-19 pandemic continue to extend beyond direct care of affected patients[1], particularly impacting outpatient diagnostics including GI endoscopy. Considerable concerns remain around the potential impact on detection of, and survival from, significant disease such as cancer [2,3]. In mid-2020, a pandemic deceleration phase[4] in the United Kingdom led to a period of intense 'restart and recovery' activity in endoscopy to mitigate the effects of delayed or cancelled procedures. This was supported by professional society guidance on the development of 'COVID-minimised' or 'green' pathways with nasopharyngeal swab (NPS) testing of patients before their attendance for the procedure[5–7]. Activity was limited by the impact on endoscopy staff and resources, but additionally by patient concerns regarding the risk of transmission by attending hospital; a complex and multifactorial challenge[8,9]. A multicentre study of COVID-19 transmission following outpatient endoscopy in the deceleration phase (when community infection rates were low) demonstrated that, with appropriate infection prevention and control (IPC) measures in place[5,10], there were no recorded cases of transmission in over 6200 patients[11].

In early December 2020, the effect of a new SARS-Cov-2 variant (termed VOC 202012/01) was associated with an acceleration phase in southeast England[12,13]. Pre-existing IPC measures had been developed to facilitate safe endoscopy during a pandemic deceleration or recovery phase (with relatively low rates of community infection)[7]. These comprised telephone screening for COVID-19 symptoms; pre-procedure NPS testing (even in asymptomatic individuals); separation of pathways according to perceived or actual transmission risk and the potential for aerosol generation. Furthermore, a variety of testing strategies, with varying levels of accuracy, have been employed across hospitals in the UK and internationally[14–16]. Despite these concerns, the negative predictive value (NPV), even of an imperfect test, was felt to be sufficiently high to rely on NPS as a cornerstone of the 'green' pathway[7]. As NPV is dependent on prevalence, we sought to determine whether IPC measures were sufficient to prevent COVID-19 transmission during an acceleration pandemic phase, with rising prevalence as well as a more infectious viral variant.

This multi-centre prospective study collected data from consecutive outpatients attending for elective diagnostic or therapeutic endoscopy from eight centres across southeast England. No patient identifiable data were collected, no treatment decisions were affected and no identifiable data were analysed or transferred. Review by the Research Governance committee at the lead author's institution confirmed that ethical approval was not required. Participating centres were invited to submit data for the three-week period 14th to 31st December 2020 inclusive, based on the identification of an acceleration phase as above, with rising community incidence in the areas served

by those hospitals (at least 800 cases per 100,000 population per week; figure 1; compared to <10 per 100,000 in August 2020 [13,17]). These were three London tertiary care hospitals, two London secondary care hospitals and three secondary care hospitals in southeast England (the county of Kent adjacent to London).

All centres prospectively completed an anonymised database of patients including procedure type, responses to pre-procedure SCOTS criteria[7], preprocedural NPS result, source of referral and dates for all activities. All centres conducted patient follow-up by telephone consultation at 7 and 14 days after the procedure to check for symptoms of COVID-19. If symptoms were reported, all patients who had not already been tested based upon their development of symptoms underwent NPS testing according to local or national protocols and the results were recorded. In all cases, regardless of NPS result, the outcome of symptoms was noted and, in cases testing positive for SARS-CoV-2, a root-cause analysis was performed by the reporting hospital to determine the most likely source of transmission. The mean incubation period for COVID-19 is understood to be around 5 days[18–20]. In order to be attributed to transmission in the endoscopy unit, therefore, patients must have developed symptoms within 10 days of attendance and have no other more likely source of transmission identified on direct questioning by the local care team.

Data were collected from n=2440 (48.8% female) patients undergoing diagnostic or therapeutic endoscopy (n=966 (39.6%) upper endoscopy; figure 1).

Before endoscopy, 9/2449 (0.37%) asymptomatic patients were positive for SARS-CoV-2 and had their procedures deferred. These nine patients were not included in further analysis. After endoscopy, 30/2440 (1.27%) developed symptoms suspicious for COVID-19, with 16 (0.65%) testing positive on NPS. All cases recovered without the need for hospital admission. After analysis, there were three (0.12%) cases where no other likely source of transmission was identified, other than the attendance for endoscopy (table 1). There were no cases of transmission to staff members as a direct result of these cases. It was not possible to calculate overall rates of infection in staff as the number of staff in units was highly variable with significant rotation due to secondment or redeployment, but there were only six confirmed cases in staff members across all participating sites. Rates of staff absence varied considerably, with three hospitals (two tertiary and one secondary care) reporting no absence due to COVID-19 in the three-week period of the study. One hospital reported absence of nearly 75% of its endoscopy staff due to two infected staff members (from community transmission), mandating isolation for the others while testing was performed. This was primarily due to uncertainty around adherence to IPC measures in a break room. No COVID-19 cases in either patients or staff required hospitalisation or additional treatment and all resolved without further event.

Table 1. Analysis of COVID-19 cases confirmed by NPS after symptom onset. *In all cases, symptoms resolved without admission to hospital or other intervention*

Case	Hospital	Total endoscopy activity (cases)	Procedure	Days from endoscopy to symptom onset	Cause identified on review	Attributed to endoscopy?
1	A	440	Colonoscopy	12	Attended for CT scan on day 5 after endoscopy (non-swab)	No
2	B	458	OGD	7	No other likely source identified	Yes
3			Colonoscopy	5	Attended Emergency Department on day prior to endoscopy	No
4	C	263	Colonoscopy	6	No other likely source identified	Yes
5			Colonoscopy	3	Family member with confirmed infection prior to attendance*	No
6			Sigmoidoscopy	2	Multiple family members with confirmed infection†	No
7			Colonoscopy	4	Attended for CT scan 3 days prior to endoscopy (non-swab)	No
8	D	462	ERCP	5	Temporary admission to ward where outbreak occurred	No
9			Colonoscopy	2	Family member had confirmed infection prior to attendance*	No
10			OGD	5	Family member had confirmed infection prior to attendance*	No
11			Colonoscopy	8	Hospital staff; returned to work immediately after endoscopy	No
12			Colonoscopy	2	Family member had confirmed infection prior to attendance*	No
13	E	194	ERCP	13	Family member had confirmed infection after attendance*	No
14			ERCP	11	No other likely source identified	Yes
15			OGD	1	Family member had confirmed infection prior to attendance*	No
16	F	472	OGD	4	NHS employee (administrative) with multiple duties in hospital	No

*2 – secondary care; 3 – tertiary care; ERCP – endoscopic retrograde pancreatography; OGD – oesophagogastroduodenoscopy; *Cases known only in retrospect, between preprocedure NPS and attendance; †History not disclosed by patient prior to attendance (preprocedure telephone questionnaire)*

Comments

This multicentre prospective study of 2440 patients undertaken during a pandemic acceleration phase of a more infectious SARS-Cov-2 variant provides reassurance that GI endoscopy is associated with a very low risk of transmission for both patients and staff.

While asymptomatic positive rates are higher than the previous study[11], the rate remains low, at less than 0.5%. The risk of acquiring COVID-19 from endoscopy continues to remain very low. However, it is important to acknowledge that this rate is not zero. This serves to emphasise the need for vigilance and strict adherence to the principle of a COVID-minimised pathway.

The risk of missed or delayed cancer diagnosis would appear to significantly outweigh the risks of COVID-19 transmission. We believe these data should be of continued reassurance to healthcare providers and patients alike, facilitating the provision of much-needed endoscopy services.

Contributor statement

Collaborative authors participated in data collection, while BH, PB, CR, IP contributed equally to the conception, writing and editing of the manuscript.

Figure 1. Rolling-rate of new cases in the regions served by the hospitals participating in this study (as of December 15th 2020). *Downloaded with permission from (*[13]*). Rates are per 100,000 population.*

Figure 2. Proportions of procedures performed.

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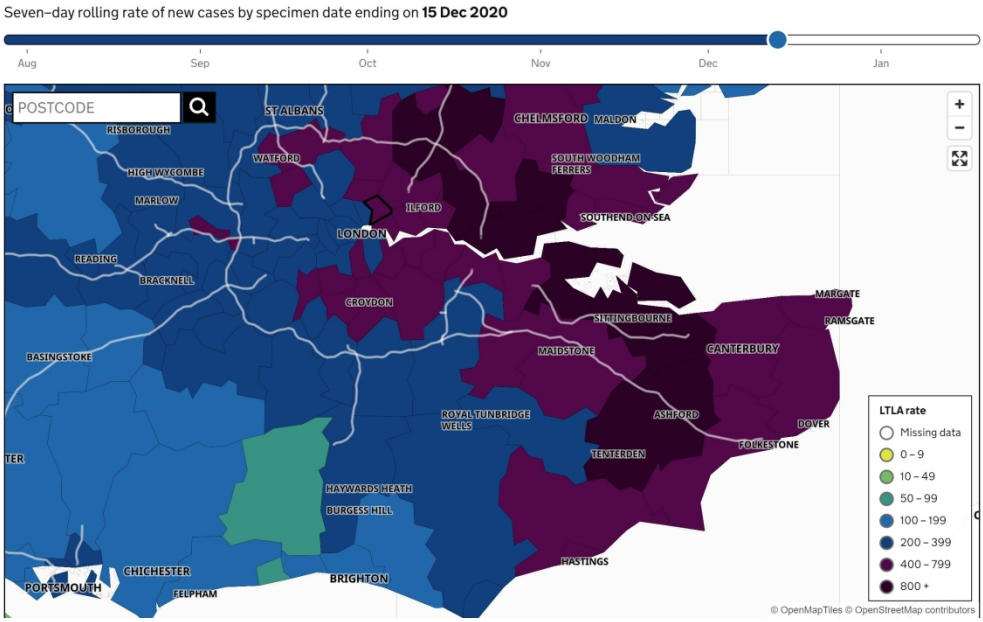

Figure 1

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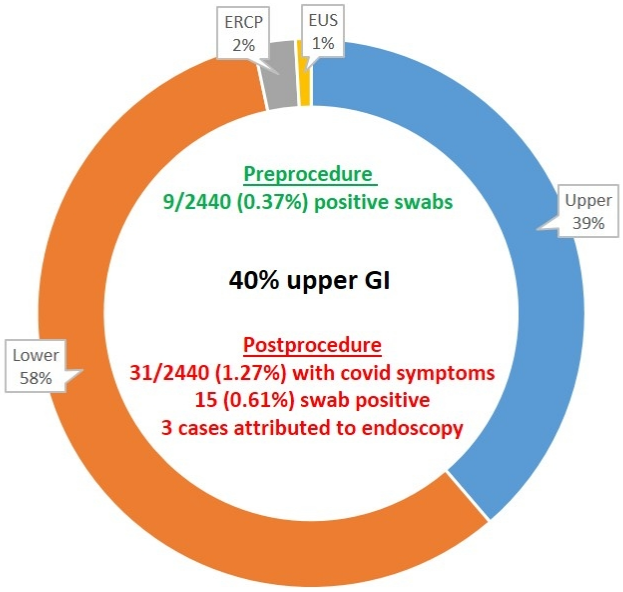

Figure 2

169x106mm (150 x 150 DPI)

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Message

Infection prevention and control (IPC) measures put in place during the first phases of the COVID-19 pandemic were effective in reducing endoscopy-related transmission while allowing recovery of activity.

In late 2020 a novel, more infectious, SARS-CoV-2 variant (VOC 202012/01) was associated with a second 'surge' or acceleration phase in the UK. We sought to measure whether pre-existing IPC guidance would be sufficient to prevent transmission in this scenario. Prospective data were collected from eight UK centres for n=2440 procedures. Pre-endoscopy, nine (0.37%) asymptomatic patients were positive for SARS-CoV-2 by nasopharyngeal swab (NPS) testing and their procedures deferred. Post-endoscopy, thirty (1.27%) developed symptoms suspicious for COVID-19, with fifteen (0.65%) testing positive on NPS. Three (0.12%) cases were attributed to potential transmission from endoscopy attendance. All 15 patients recovered fully requiring only community treatment.

Although we report cases potentially transmitted by endoscopy attendance in this latest study, the risk of COVID-19 transmission following outpatient endoscopy remains very low. Thus, IPC measures developed in earlier pandemic phases appear robust, but our data emphasise the need for vigilance and strict adherence to these measures in order to optimally protect both patients and staff. ~~The infection prevention and control (IPC) measures put in place at the start of the COVID-19 pandemic in 2020 severely curtailed elective, outpatient gastrointestinal (GI) endoscopy worldwide. The postpeak period in late 2020 in the UK led to period of intense 'restart and recovery' activity. This was informed by a multicentre study of COVID-19 transmission in the UK showing no cases of transmission in over 6200 procedures. There was considerable concern around the validity of swab testing with the potential for missed asymptomatic cases of disease, but multi-professional guidance and IPC measures appear to have mitigated the risk of inadvertent transmission. In late 2020, a novel SARS-CoV-2 variant (VOC 202012/01) was associated with a second 'surge' or acceleration phase – at the time localised to areas of London and south-east England. We sought to document the risk of COVID-19 transmission following outpatient endoscopy in the setting of increasing community prevalence (and a more infectious virus variant). We wished to determine whether pre-existing IPC guidance would be sufficient to prevent transmission. Prospective data were collected from eight UK centres for n=2440 procedures. Pre-endoscopy, nine (0.37%) asymptomatic patients were positive for SARS-CoV-2 by nasopharyngeal swab (NPS) testing and their procedures deferred. Post-endoscopy, 30 (1.27%) developed symptoms suspicious for COVID-19, with 16 (0.65%) testing positive on NPS. All recovered without in-patient admission and three (0.12%) cases were attributed to potential transmission from endoscopy attendance.~~

~~The asymptomatic positive NPS rate has increased from that reported during the first recovery phase of the pandemic. Although we do now report cases potentially transmitted by endoscopy attendance in this latest study, the risk of COVID-19 transmission following outpatient endoscopy remains very low. IPC measures developed in earlier pandemic phases appear robust, but our data emphasise the need for vigilance and strict adherence to these measures in order to optimally protect both patients and staff.~~

In more detail

The effects of the COVID-19 pandemic continue to extend beyond direct care of affected patients[1], particularly impacting outpatient diagnostics including GI endoscopy. Considerable concerns remain around the potential impact on detection of, and survival from, significant disease such as cancer [2,3]. In mid-2020, a pandemic deceleration phase[4] in the United Kingdom led to a period of intense 'restart and recovery' activity in endoscopy to mitigate the effects of delayed or cancelled procedures. This was supported by professional society guidance on the development of 'COVID-minimised' or 'green' pathways with nasopharyngeal swab (NPS) testing of patients before their attendance for the procedure[5–7]. Activity was limited by the impact on endoscopy staff and resources, but additionally by patient concerns regarding the risk of transmission by attending hospital; a complex and multifactorial challenge[8,9]. A multicentre study of COVID-19 transmission following outpatient endoscopy in the deceleration phase (when community infection rates were low) demonstrated that, with appropriate infection prevention and control (IPC) measures in place[5,10], there were no recorded cases of transmission in over 6200 patients[11].

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