

Methods

Policy for COVID-19 testing

The patients undergoing endoscopic procedures were not tested routinely for COVID-19 except at one of the participating centres (SGPGI). They were tested only if they had any symptoms suggestive of COVID-19, had a history of contact with COVID-19 positive patient or had a history of travel or stay in containment zones. The patients were also followed up telephonically after two weeks of their endoscopic procedure for COVID-19 related symptoms or confirmed diagnosis of COVID-19 after endoscopic procedures. The healthcare workers involved in the endoscopy procedures and those posted in the endoscopy theatre were screened for symptoms periodically and tested in case of either new onset symptom suggestive of COVID-19 or contact with a positive patient. Infection to the endoscopic personnel and patients was confirmed by RT-PCR of throat and nasal swabs. The centre that was routinely performing COVID-19 testing prior to every endoscopic procedure was excluded from the safety and cost benefit analysis.

Measures for prevention of cross infection in endoscopy suite

All the centres followed a standard protocol as advised by multiple guidelines to minimize the risk of the spread of infection in the endoscopy suite. Entry to the endoscopy suite was restricted and only one relative of patient was allowed to enter. All the patients were provided with face masks which was removed only during the endoscopic procedure. Procedure was completed preferably in the same trolley used to shift the patient to endoscopy suite rather than shifting to the endoscopy suite trolley. The number of endoscopy personnel in the suite was limited with only one senior skilled endoscopist and limited number of nurse assistants. The endoscopy personnel switched to the hospital scrubs after entering the endoscopy suite followed by donning of level 2 PPE which included a head to toe water impermeable gown,

hairnet, shoe cover, N95 masks, face shield or goggles and double pair of gloves. The same endoscopy team performed all the endoscopic procedures scheduled during one day and repeated donning and doffing was avoided in view of restricted supply with only change of outer pair of gloves between procedures. Only one endoscopic procedure was performed at one time. After each procedure, the endoscope was disinfected with 2% glutaraldehyde solution. A thorough cleaning of the endoscopy suite was done at the end of the day with 1% hypochlorite solution.

Results

Supplementary Table. Details of Endoscopic procedures performed during lockdown to combat COVID-19 pandemic

	AIIMS	GB Pant	PGIMER	CMC	SGPGI	Total
Total Number of Procedures Performed	290	340	274	545	100	1549
A. EGD						
Total number	220	234	180	362	68	1064
Indications						
Upper GI bleeding	148 (67.3%)	129 (55.2%)	78 (43.3%)	96 (26.5%)	40 (58.8%)	491 (46.1%)
Dysphagia	13 (5.9%)	39 (16.7%)	31 (17.2%)	29 (8%)	2 (2.9%)	114 (10.7%)
Foreign body removal	0	4 (1.7%)	0	5 (1.4%)	1 (1.5%)	10 (0.9%)
Gastric outlet obstruction	18 (8.2%)	20 (8.5%)	33 (18.3%)	6 (1.7%)	5 (7.4%)	82 (7.7%)
Corrosive injury	15 (6.8%)	28 (12%)	6 (3.3%)	17 (4.7%)	0	66 (6.2%)
Functional bowel disorders	11 (5%)	8 (3.4%)	0	62 (17.1%)	4 (5.9%)	85 (8%)
Enteral tube placement (RT/NJ/PEG)	13 (5.9%)	6 (2.6%)	31 (17.2%)	25 (6.9%)	6 (8.8%)	81 (7.6%)
Cancer screening	1 (0.5%)	0	0	32 (8.8%)	0	33 (3.1%)
Variceal assessment	0	0	0	33 (9.1%)	0	33 (3.1%)
Anemia evaluation	0	0	0	20 (5.5%)	0	20 (1.9%)
Evaluation for recurrent vomiting	0	0	0	17 (4.7%)	0	17 (1.6%)
Chronic diarrhoea for biopsy	0	0	0	102.8%)	5	15 (1.4%)
Removal of SEMS	0	0	0	4 (1.1%)	0	4 (0.4%)
Others	1¥ (0.5%)	0	1¥ (0.6%)	6¥ (1.7%)	5¥ (7.4%)	13 (1.2%)
Findings on EGD						
Normal Study	6 (2.7%)	11 (4.7%)	2 (1.1%)	12 (3.3%)	8 (11.8%)	39 (3.7%)

Benign esophageal stricture	10 (4.5%)	22 (9.4%)	6 (6.1%)	9 (2.5%)	0	47 (4.4%)
Carcinoma esophagus	11 (5%)	13 (5.6%)	11	9 (2.5%)	2 (2.9%)	46 (4.3%)
GERD/esophagitis	1 (0.5%)	0	0	26 (7.2%)	2 (2.9%)	29 (2.7%)
Esophageal ulcer	0	0	0	4 (1.1%)	0	4 (0.4%)
Esophageal candidiasis	0	0	0	9 (2.5%)	1 (1.5%)	10 (0.9%)
Esophageal Varices	86 (39.1%)	73 (31.2%)	53 (29.4%)	55 (15.2%)	13 (19.1%)	280 (26.3%)
Fundal varices	21 (9.5%)	6 (2.5%)	10 (5.6%)	19 (5.3%)	4 (5.9%)	60 (5.6%)
PHG	8 (3.6%)	19 (8.2%)	7 (3.9%)	31 (8.6%)	7 (10.3%)	72 (6.8%)
Gastric antral vascular ectasia	2 (0.9%)	3 (1.3%)	2 (1.1%)	3 (0.8%)	3 (4.4%)	12 (1.1%)
Mallory Weiss Tear	3 (1.4%)	0	1 (0.6%)	5 (1.4%)	0	9 (0.8%)
Gastritis	7 (3.2%)	11 (4.7%)	10 (5.5%)	73 (20.2%)	8 (11.8%)	109 (10.2%)
Duodenal ulcer	9 (4.1%)	9 (3.8%)	18 (10%)	14 (3.9%)	2 (2.9%)	52 (4.9%)
Gastric Ulcer	10 (4.5%)	8 (3.4%)	6 (3.3%)	18 (5%)	3 (4.4%)	45 (4.2%)
Gastric polyps	0	4 (1.7%)	0	4 (1.1%)	0	8 (0.8%)
Gastric Malignancy	14 (6.4%)	18 (7.7%)	8 (4.4%)	21 (5.8%)	2 (2.9%)	63 (5.9%)
Benign Gastric outlet obstruction	3 (1.4%)	2 (0.9%)	6 (3.3%)	2 (0.6%)	5 (7.4%)	18 (1.7%)
Malignant Gastric outlet obstruction	14 (6.4%)	16 (6.8%)	25 (13.9%)	8 (2.2%)	3 (4.4%)	66 (6.2%)
Post EVL ulcers	5 (2.3%)	5 (2.1%)	0	2 (0.6%)	0	12 (1.1%)
Others	1a (0.5%)	1a (0.4%)	0	4a (1.1%)	4a (5.9%)	10 (1%)
Therapy Done						
None/biopsy	129 (58.6%)	145 (62%)	85 (47.2%)	288 (79.6%)	49 (72.1%)	676 (63.5%)
Esophageal stricture dilatation	1 (0.5%)	22 (9.4%)	12 (6.7%)	5 (1.4%)	1 (1.5%)	41 (3.9%)
Variceal Band Ligation	66 (30%)	48 (20.5%)	40 (22.2%)	16 (4.4%)	9 (13.2%)	179 (16.8%)
Glue injection	23 (10.5%)	6 (2.6%)	6 (3.3%)	6 (1.7%)	1 (1.5%)	42 (3.9%)
Sclerotherapy	0	1 (0.4%)	1 (0.6%)	4 (1.1%)	2 (2.9%)	8 (0.8%)
APC application	6 (2.7%)	1 (0.4%)	1 (0.6%)	3 (0.8%)	1 (1.5%)	12 (1.1%)
Hemoclip application	3 (1.4%)	1 (0.4%)	4 (2.2%)	14 (3.9%)	0	22 (2.1%)
Enteral Tube placement (RT/NJ)	12 (5.5%)	6 (2.5%)	31 (17.2%)	24 (6.6%)	5 (7.4%)	78 (7.3%)
Thermocoagulation	0	4 (1.7%)	0	0	0	4 (0.4%)
Adrenaline injection	0	0	0	2 (0.6%)	0	2 (0.2%)
Others	3b (1.4%)	3b (1.3%)	1b (0.6%)	4b (1.1%)	1b (1.5%)	12 (1.1%)
B. Colonoscopy						
Total number of procedures performed	23	40	45	101	15	224
Indications of procedure						
Lower GI bleeding	21 (91.3%)	29 (72.5%)	43 (95.6%)	35 (34.7%)	10 (66.7%)	138 (61.6%)
Cancer screening	0	0	0	35 (34.7%)	4 (26.7%)	39 (17.4%)
Altered bowel habits	0	0	0	5 (5%)	0	5 (2.2%)

Suspected IBD	1 (4.4%)	0	0	15 (14.9%)	1 (6.7%)	17 (7.6%)
Anemia evaluation	0	0	0	6 (5.9%)	0	6 (2.7%)
Others	1c (4.4%)	11c (27.5%)	2c (4.4%)	5c (5%)	0	19 (8.5%)
Findings on colonoscopy						
Normal Study	7 (30.4%)	5 (12.5%)	19 (42.2%)	34 (33.7%)	0	65 (29%)
Colonic ulcers (IBD related)	3 (13%)	11 (27.5%)	10 (22.2%)	8 (7.9%)	2 (13.3%)	34 (15.2%)
Colonic ulcers (infective)	3 (13%)	1 (2.5%)	10 (22.2%)	8 (7.9%)	2 (13.3%)	24 (10.7%)
Colonic malignancy	1 (4.4%)	12 (30%)	3 (6.7%)	9 (8.9%)	1 (6.7%)	26 (11.6%)
Colonic polyps	0	3 (7.5%)	0	18 (17.8%)	4 (26.7%)	25 (11.2%)
Diverticula	1 (4.4%)	0	0	2 (2%)	0	3 (1.3%)
Hemorrhoids	6 (26.1%)	6 (15%)	0	8 (7.9%)	4 (26.7%)	24 (10.7%)
Others	2d (8.7%)	2d (5%)	3d (6.7%)	14d (13.9%)	2d (13.3%)	23 (10.3%)
Therapy Performed						
None/biopsy	20 (87%)	38 (95%)	44 (97.8%)	81 (80.2%)	13 (86.7%)	196 (87.5%)
Hemoclip application	1 (4.3%)	0	0	1 (1%)	0	2 (0.9%)
Polypectomy	0	2 (5%)	0	7 (6.9%)	0	9 (4%)
APC Application	2 (8.7%)	0	1 (2.2%)	2 (2%)	0	5 (2.2%)
Hemorrhoidal banding	0	0	0	0	2 (13.3%)	2 (0.9%)
Others	0	0	0	4e (4%)	0	4 (1.8%)
C. ERCP						
Total number of procedures performed	32	48	47	37	13	177
Indication for the procedure						
Cholangitis	29/32	38/48	38/47	6/37	6/13 (46.2%)	87/177 (49.2%)
CBD stone	21/32	27/48	30/47	20/37	4/13 (30.8%)	102/177 (57.6%)
CBD stricture (benign)	3/32	9/48	7/47	3/37	2/13 (15.4%)	24/177 (13.6%)
Preoperative biliary drainage	2/32	5/48	4/47	2/37	0	13/177 (7.3%)
Palliative biliary drainage	6/32	4/48	2/47	4/37	1/13 (7.7%)	17/177 (9.6%)
Therapy for chronic pancreatitis	0	3/48	4/47	1/37	4/13 (30.8%)	12/177 (6.8%)
Others	0	0	0	1/37 f	1/15 (7.7%) f	2/177 (1.1%)
D. Endosonography						
Total procedures	3	18	2	34	4	61
Diagnostic procedures	2/3 (66.7%)	2/18 (11.1%)	2/2 (100%)	17 (50%)	2/4 (50%)	25/61 (41%)
FNA	0	10 (55.6%)	0	9 (26.5%)	1/4 (25%)	20/61 (32.8%)
Drainage of pancreatic fluid collection	1 (33.3%)	4 (22.2%)	0	5 (14.7%)	1/4 (25%)	11/61 (18%)
Biliary drainage	0	2 (11.1%)	0	0	0	2/61 (3.3%)
Variceal Injection	0	0	0	3 (8.8%)	0	3/61 (4.9%)
E. Percutaneous endoscopic necrosectomy	6	0	0	0	0	6

F. Other procedures	6g	0	0	11g	0	17
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¥ AIIMS: Tracheoesophageal fistula

¥ PGIMER: Tracheoesophageal fistula

¥ (CMC): Tracheoesophageal fistula, Aortoesophageal fistula (graft assessment), Healing of Gastric ulcer, Persistent Hiccough, Post op repair of Gastric perforation, GVHD suspect

¥ (SGPGI) Periampullary growth-4, Ascites under evaluation-1

a (AIIMS): TEF

a (GB Pant): Esophageal lymphoma with SEMS block

a (CMC): TEF-1; esophageal SM lesion-1; choledochoduodenal fistula-1; Achalasia Cardia-1, duodenal varix-1

a (SGPGI): Periampullary growth-4

b (AIIMS): Esophageal SEMS-1; pyloric stricture dilatation-1; Antral SEMS-1

b (Gb Pant): Esophageal SEMS-1; pyloric stricture dilatation-1; Antral SEMS-1

b (PGIMER): Esophageal SEMS

b (CMC): Sengstaken Blakemore Tube placement-2; Hemospray-2

b (SGPGI): foreign body removal-1

c (AIIMS) stricture-1

c (PGIMER): strictures dilatation-2

c (CMC) Abdominal pain-suspected GI Tuberculosis, suspected GI vasculitis, pyrexia of unknown origin, 2 sigmoid volvulus decompression

d (AIIMS): Radiation proctitis-2

d (GBPH): Rectal varices-2

d (PGIMER): Stricture -2, radiation proctitis-1

d (CMC) Sigmoid hematoma-1, Non-specific ileal inflammation-1, acute colitis-1, sigmoid volvulus-2, stricture-2, angioectasia-1, SRUS-1, stercoral ulcer-1, amyloid angiopathy-1, GVHD-1, GIST-1, Radiation proctitis-1

e (CMC) EMR-1, colonic decompression-2, SEMS-1

f (CMC): Brush cytology

f (SGPGI): Bile leak

g (AIIMS): Sigmoidoscopy-6

g (CMC): Double balloon enteroscopy-1. Side viewing enoscopy-4, sigmoidoscopy-6

Institutes: **AIIMS**: All India Institute of Medical Sciences, New Delhi; **CMC**: Christian Medical college, Vellore; **GB Pant**: Govind Ballabh Pant Hospital, New Delhi; **PGIMER**: Post Graduation Institute of Medical Education and Research, Chandigarh; **SGPGI**: Sanjay Gandhi Post Graduate Institute, Lucknow

Abbreviations: ERCP: endoscopic retrograde cholangiopancreatography; FNA: fine needle aspiration; GI: Gastrointestinal; GVHD: graft versus host disease; CBD: common bile duct; IBD: inflammatory bowel disease; NJ: Nasojejunal tube; PEG: percutaneous endoscopic gastrostomy; RT: Ryles tube; SEMS: self-expanding metal stent; SM: submucosal; SRUS: solitary rectal ulcer syndrome; TEF: Tracheoesophageal fistula;

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