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RAPID COMMUNICATION

Role of intravenously administered hyoscine butyl bromide in retrograde terminal ileoscopy: A randomized, double-blinded, placebo-controlled trial

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Abstract

AIM: To evaluate the role of hyoscine butyl bromide in facilitating retrograde ileoscopy.

METHODS: Retrograde terminal ileoscopy was attempted in 200 consecutive patients undergoing colonoscopy. After intubation of the cecum and visualization of the ileocecal valve, hyoscine butyl bromide injection or normal saline was given intravenously to the patients in a double blind random fashion. The pulse rate and oxygen saturation were measured continuously. After completion of the procedure, endoscopists were then asked to score the ease of intubation and the ease of visualization of the terminal ileum on a visual scale of 1 to 10. The patients were also asked to score the pain after receiving hyoscine butyl bromide injection on a score of 1 to 10.

RESULTS: Terminal ileoscopy could be performed in 188 patients. The mean (SD) visual analogue score for the ease of intubation of the cecum was 7.4 (0.65) in the injection group and 5.9 (0.8) in the placebo group ($P < 0.001$). The mean (SD) length of ileum visualized in the injection group was 14.4 (3.3) cm and 10.4 (2.7) cm in the placebo group ($P < 0.001$). The mean (SD) visual analogue score for ease of visualization of the terminal ileum was 7.5 (0.69) in the injection group and 5.9 (0.7) in the placebo group ($P < 0.001$). The pain score experienced by the patients was 6.5 (0.7) in the injection group and 6.7 (0.69) in the placebo group ($P < 0.008$). Although the pulse rate increased significantly in patients receiving the drug, no statistically significant difference was noted in the oxygen saturation between the two groups either before or after administration of the drug. No complications were observed in either of the groups.

CONCLUSION: Hyoscine butyl bromide injection is a useful adjunct in helping the intubation and visualization of terminal ileum during colonoscopy.

Key words: Ileoscopy; Colonoscopy; Colon; Ileum; Hyoscine; Tuberculosis; Inflammatory bowel disease; Cancer

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INTRODUCTION

Colonoscopy is the procedure of choice for investigating patients with diseases of the colon and terminal ileum, such as colonic adenomas or cancer, fecal occult blood loss, inflammatory bowel disease, iron deficiency anemia, colonic tuberculosis and hematochezia[1-8].

Terminal ileoscopy is an integral part of complete colonoscopy. Retrograde terminal ileoscopy has been noted to be useful in patients with inflammatory bowel disease, diarrhea, lymphoma, cytomegalovirus-induced ileitis, tuberculosis, portal hypertension and a host of other conditions involving the terminal ileum[7-21]. In a recent study, we have noted that obtaining blind biopsies from even a normal-appearing terminal ileum is useful in patients suspected of having ileocaecal tuberculosis[22]. Although terminal ileoscopy has been recommended by several authors[7-10,22], it is not routinely performed when colonoscopy is done in all patients undergoing colonoscopy[3]. A more recent study showed that routine ileoscopy is very useful and easy to perform after proper training has been imparted. Except for a study that found that hyoscine butyl bromide injection is helpful in performing ileoscopy[23], the role of hyoscine butyl bromide in facilitating retrograde terminal ileoscopy has not been evaluated. The present study was therefore planned to evaluate the role, if any, of hyoscine butyl bromide injection in performing ileoscopy at colonoscopy.

MATERIALS AND METHODS

Retrograde terminal ileoscopy was attempted in 200

Table 1 Indications for colonoscopy in two groups of patients *n* = 200

Indication	Group 1 (active drug)	Group 2 (placebo)	Total
Unexplained abdominal pain	55	56	111
Suspected colonic tuberculosis	14	12	26
Ulcerative colitis	11	13	24
Hematochezia	5	5	10
Fecal occult blood positive	4	6	10
Colon cancer	2	4	6
Occult gastrointestinal bleeding	2	2	4
Colonic polyp	1	2	3
Portal hypertension (colonic bleed)	2	1	3
Crohn's disease	2	1	3

Table 2 Effect of hyoscine N-butyl bromide on the vital parameters mean ± SD

	Drug	Placebo	*P*
Pulse rate before administration	85.7 (4.7)	85.6 (3.8)	NS
Pulse rate after procedure	93.2 (4.9)	86.5 (3.9)	< 0.001
Highest pulse rate achieved before ileoscopy	94	92	
Highest pulse rate achieved during ileoscopy	102	92	
Po_2 before administration	95.4 (1.5)	95 (1.3)	NS
Po_2 after administration	94.4 (1.8)	94.6 (1.7)	NS
Minimum Po_2 before ileoscopy	92	94	NS
Minimum Po_2 during ileoscopy	90	90	NS

consecutive patients undergoing colonoscopy. Colonic preparation was performed using a polyethylene glycol-electrolyte-based solution (Peglec, Tablets India, Ltd, Chennai, India).

Patients with a previous history of abdominal surgery, glaucoma, obstructive uropathy, autonomic dysfunction and allergy to hyoscine butyl bromide (Buscopan) were excluded from the study. All patients received midazolam for conscious sedation. Colonoscopy was performed using an Olympus videocolonoscope (CF 130 L, Olympus, Tokyo) without any attachment.

At colonoscopy, a careful search was made for any lesion in the colon. After reaching the cecum, attempt was made to localize the ileocecal opening. Once it was visualized, 1 mL of hyoscine butyl bromide injection (German Remedies, Mumbai) containing 20 mg of the drug or an equal volume of normal saline was administered intravenously to the patients in a double blind random fashion by a nursing assistant. Once in the terminal ileum all attempts were made to go as far as possible in the ileum. Any abnormality in mucosa of the terminal ileum was carefully recorded and biopsies were obtained from suspicious-looking lesions. The endoscopists scored the ease of intubation and the ease of visualization of the terminal ileum on a visual analogue score of 1-10. The length of terminal ileum visualized was also recorded during withdrawal of the colonoscope, when the length of the colonoscope inside the ileocecal valve was measured. The pulse rate and oxygen saturation were measured continuously using a pulse oximeter. However for the study purposes the values just before administration of hyoscine butyl bromide or saline and at the end of the procedure were taken. After the procedure the patients scored the pain they felt while the terminal ileum was intubated or visualized, on a visual analogue score of 1-10.

Statistical analysis was performed using the Student's *t*-test and chi-square test with or without Yates' correction as appropriate. All patients gave their informed consent and IRB clearance was obtained before start of the trial.

RESULTS

During the study period, 200 colonoscopies were performed. The indications for colonoscopy are given in Table 1. The cecum could be intubated in all patients. Repeat colonoscopy had to be performed in 21 (10.5%) patients due to poor preparation during the first colonoscopy.

Despite all attempts, the terminal ileum could not be intubated in 12 patients: 4 due to deformed ileocecal valve and 8 due to non-visualization of the ileocecal opening. These patients were excluded from the final analysis. Hyoscine butyl bromide injection was administered to 2 patients and normal saline to 2 patients with deformed ileocecal valve respectively. As per protocol, injections were administered only on visualization of the ileocaecal opening and therefore no injection was given to patients in whom the ileocecal valve was not visualized.

The mean (SD) age of these patients was 44.7 (10.6) years (range 25-65 years). There were 147 males and 41 females in the study.

There were 94 patients in both groups. The mean (SD) visual analogue score for the ease of intubation was 7.4 (0.65) in the injection group and 5.9 (0.8) in the placebo group. The difference between the two groups was statistically significant ($P < 0.001$). The mean (SD) length of ileum visualized was 14.4 (3.3) cm in the injection group and 10.4 (2.7) cm in the placebo group ($P < 0.001$). The mean (SD) visual analogue score for ease of visualization of the terminal ileum was 7.5 (0.69) in the injection group and 5.9 (0.7) in the placebo group ($P < 0.001$). The mean (SD) pain score experienced by the patients was 6.5 (0.7) in the injection group and 6.7 (0.69) in the placebo group. The difference between the two groups was statistically significant ($P < 0.008$).

The effect of the drug on the vital parameters is shown in Table 2. Although the pulse rate increased significantly in patients receiving the drug, no statistically significant difference was noted in the oxygen saturation between the two groups either before or after administration of the drug.

DISCUSSION

Colonoscopy remains the procedure of choice for most diseases of the large bowel[1]. Although colonoscopy is performed routinely for suspected abnormalities of the colon[1], ileoscopy is not commonly employed in the work-up of patients with ileocolonic abnormalities[3]. Despite the fact that a number of studies have demonstrated the utility of retrograde ileoscopy during colonoscopic examination of the large bowel[7-22], a recent study speculated that

perceived difficulty of ileal intubation, time constraints, and the expectation of a low diagnostic yield are the likely reasons for the resistance on the part of the endoscopists in attempting retrograde ileoscopy[3].

We did not study the success of terminal ileal intubation in the two groups as the rate of terminal ileal intubation is high in the hands of the experienced and motivated endoscopists. However, the results of the present study were encouraging and hyoscine butyl bromide injection was noted to have a salutary effect on all the parameters evaluated in the study, including the ease of terminal ileal intubation and the length of the terminal ileum visualized. This should be helpful in motivating endoscopists to perform retrograde terminal ileoscopy. Even the patients perceived the procedure to be less painful when hyoscine butyl bromide was administered. Moreover, adverse effects were not observed, although the patients receiving the drug had significant tachycardia compared to those receiving placebo (Table 2).

Injection of hyoscine butyl bromide has been utilized to achieve aperistalsis in patients undergoing ERCP. However, its role in colonoscopy is not very clear[24-28]. It should be noted that in the present study we did not use it till we achieved cecal intubation and visualized the ileocecal valve, suggesting that it should not be used to facilitate colonoscopy but only to make ileoscopy easier for the endoscopist and patients. An earlier study noted the drug is a useful adjunct in intubating the terminal ileum during routine colonoscopy[23].

Glucagon has been used in lieu of hyoscine butyl bromide for achieving aperistalsis in patients undergoing ERCP[29,30]. Glucagon has also been evaluated as an adjunct in facilitating colonoscopy[31,32]. Whether glucagon can be used in lieu of hyoscine butyl bromide in achieving ileal intubation in patients undergoing colonoscopy, remains to be studied. However, since the action of glucagon and hyoscine butyl bromide are similar, and glucagons has been used instead of hyoscine, to achieve aperistalsis during ERCP, we do not foresee any reason why glucagons cannot replace hyoscine. Although the side effects of glucagon are less, the cost is a prohibitive factor in its routine use, especially in the developing countries.

A few earlier studies have raised concern about the adverse changes in the vital parameters following administration of hyoscine butyl bromide[25,27] although not all studies observed such changes[24,26]. However, we did not observe any untoward incident or adverse changes in the vital parameters in this study, which might be due to the very short time required between administration of the drug and completion of the ileoscopy. It is important to remember that hyoscine butyl bromide or saline injection was administered only when the ileocaecal valve could be identified and the endoscopist was prepared to intubate the terminal ileum.

We have noted that retrograde terminal ileoscopy is a useful investigation in patients with ileocolonic tuberculosis[33] and can diagnose the cause of hematochezia in patients in whom an earlier colonoscopic examination fails to reveal any abnormality[34]. Obtaining blind biopsies from normal appearing cecum and terminal ileum could yield a positive diagnosis in a select group of patients suspected of having ileocecal tuberculosis[22]. The use of hyoscine butyl bromide injection would make the procedure easier and it is expected that more endoscopists would perform retrograde terminal ileoscopy while performing colonoscopy.

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