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Original Article

Canadian Association of Gastroenterology (CAG) Position Statement on the Use of Hyoscine-*n*-butylbromide (Buscopan) During Gastrointestinal Endoscopy

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ABSTRACT

Hyoscine butylbromide, also known as hyoscyamine or scopolamine, and sold under the trade name Buscopan, is an antimuscarinic agent commonly used to induce smooth muscle relaxation and reduce spasmodic activity of the gastrointestinal (GI) tract during endoscopic procedures. However, the balance between desirable and undesirable (adverse) effects is not clear when used during GI endoscopy. The Clinical Affairs Committee of the Canadian Association of Gastroenterology (CAG) conducted systematic reviews and applied the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach to develop recommendations for the use of Buscopan during GI endoscopy. To summarize, we recommend against the use of Buscopan before or during colonoscopy (*strong recommendation, high certainty of evidence*). We suggest against the use of Buscopan before or during gastroscopy (*conditional recommendation, very low certainty of evidence*). We suggest the use of Buscopan before or during ERCP (*conditional recommendation, very low certainty of evidence*). More research is needed to determine whether patients undergoing advanced procedures such as endoscopic mucosal resection or endoscopic submucosal dissection benefit from its use. Buscopan should be used with caution in patients with cardiac comorbidities. According to its product monograph, Buscopan is contraindicated in patients with tachycardia, angina, and cardiac failure. Thus, Buscopan should be used very cautiously in patients with these conditions, and only when the potential benefits of its use outweigh the potential risks in a particular case. Such patients require careful cardiac monitoring in an environment where resuscitation equipment and appropriately trained staff to use it are readily available. According to its product monograph, Buscopan is also contraindicated in patients with prostatic hypertrophy with urinary retention, and therefore, should be used very cautiously in such patients as well, and only when the potential benefits of its use outweigh the potential risks in a particular case. Obtaining a preprocedural history of glaucoma is unlikely to be of value when considering Buscopan use. However, in cases where Buscopan has been used, patients should be counselled postprocedurally and told to present to an emergency facility should they experience eye pain, redness, decreased vision, nausea and vomiting or headache.

Keywords: *Adverse events; Buscopan; Endoscopy; Quality*

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Introduction

Hyoscine butylbromide, also known as hyoscyamine or scopolamine, and sold under the trade name Buscopan, is an antimuscarinic agent commonly used to induce smooth muscle relaxation and reduce spasmodic activity of the gastrointestinal (GI) tract. As such, its use is prevalent in GI endoscopy, and colonoscopy in particular, where quality of the procedure is largely driven by metrics such as adenoma detection rate (ADR) (1) that are related to optimizing mucosal visualization. This is evidenced by a survey from the United Kingdom indicating that over 85% of gastroenterologists endorse using it at least occasionally during colonoscopy (2). In advanced procedures such as endoscopic retrograde cholangiopancreatography (ERCP), Buscopan and other antispasmodics are frequently employed to reduce small bowel spasm, thus allowing for more facile cannulation of the papilla(e) (3) and reducing adverse event (AE) rates (4).

Though generally well-tolerated, the use of Buscopan is accompanied by rare but potentially serious AEs. Due to its anticholinergic properties, Buscopan can precipitate acute angle closure glaucoma, an ophthalmologic emergency (5), though this risk does not appear to exist for patients with open angle glaucoma. The Canadian Glaucoma Society (CGS) issued a recent position statement on the use of Buscopan in endoscopic procedures (6). They concluded that the practice of inquiring about a medical history of glaucoma is of limited value, given that those at risk are either asymptomatic and unaware, or would have already been treated (6). The CGS and others have therefore proposed that patients should instead be counseled appropriately after Buscopan use regarding possible eye pain, redness, decreased vision, nausea and vomiting, or headache (6,7). However, other AEs have also been reported with Buscopan use, including tachycardia and/or hypotension (8), along with other features of the anticholinergic toxidrome. Therefore, its use in patients with cardiac conditions (including but not limited to coronary artery disease, congestive heart failure and arrhythmia) or tachycardia at the time of endoscopy is also not advised by some organizations (9).

Inconsistent results regarding the use of Buscopan in colonoscopy have been reported from several observational (10–12) and randomized controlled trials (RCTs) (13,14) as well as multiple meta-analyses (15–17). Given an unclear risk-benefit profile for this commonly employed medication in the context of endoscopy, we performed our own systematic review and meta-analysis of RCTs assessing the impact of Buscopan use (versus placebo) on endoscopic outcomes in order to inform the current Canadian Association of Gastroenterology (CAG) position statement. An overview of our methodology is provided in the Supplementary Materials. Our results are summarized herein according to endoscopic procedure types.

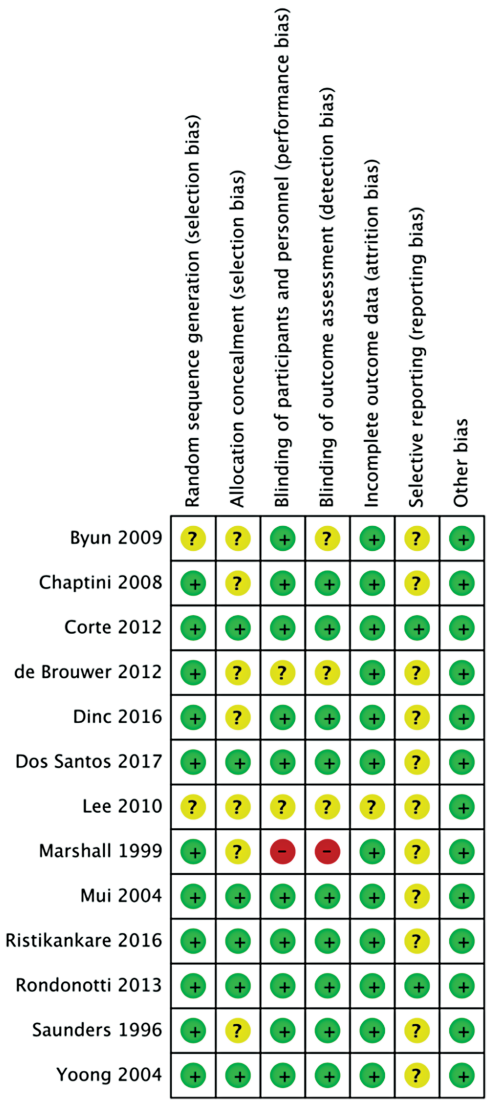


Figure 1. Risk of bias summary of randomized controlled studies assessing Buscopan versus placebo for colonoscopy. Green indicates low risk of bias, yellow indicates unclear risk of bias, and red indicates high risk of bias.

COLONOSCOPY

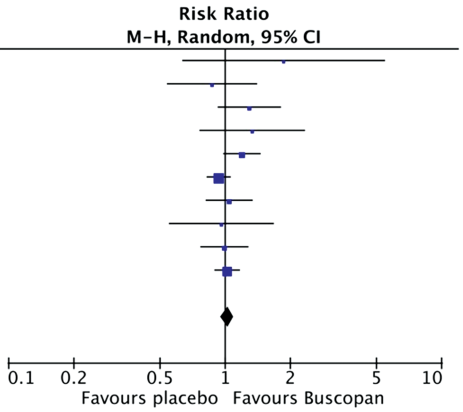
Outcomes of primary interest to us for colonoscopy were polyp detection rate (PDR), cecal intubation rate (CIR), cecal intubation time (CIT) and AEs. PDR and AEs were rated as critical for decision-making, whereas CIR was rated as important but not critical, and CIT was rated as an outcome of limited importance for decision-making. However, given that CIT might nevertheless be important to some patients, endoscopists and/or endoscopy units, this outcome was retained for analysis. Thirteen RCTs were included, in which the risk of bias was low overall (**Figure 1**). Results of meta-analyses for non-adverse event outcomes are presented in forest plots in **Figure 2**. Overall, there was no benefit of Buscopan on PDR, with a rate ratio (RR) of 1.03 (95% confidence intervals [CI] 0.95 to 1.10) based on

pooled data from 10 RCTs representing 2,884 colonoscopies. Similarly, no improvement in CIR was observed (RR 1.00, 95% CI 0.97 to 1.03). There was also no impact on CIT, with a mean difference of 0.58 minutes less (95% CI 1.23 minutes less to 0.08 minutes more) with Buscopan based on pooled data from 9 RCTs. Heterogeneity for these analyses was absent (I^2 = 0%), moderate (I^2 = 39%) and substantial (I^2 = 65%), respectively (18). Based on this meta-analysis, the Grading of Recommendations Assessment, Development and Evaluation (GRADE) framework (19) was employed to arrive at a final recommendation with regard to Buscopan use in screening-related colonoscopy, provided in the "Recommendations" section. An additional RCT comparing Buscopan to glucagon showed no differences in clinical outcomes including CIT, but significantly higher rates of tachycardia with Buscopan (20). From our review, no study has specifically assessed Buscopan use in endoscopic mucosal resection (EMR) or endoscopic submucosal dissection (ESD).

A)

Study or Subgroup	Buscopan Events	Total	Placebo Events	Total	Weight	Risk Ratio M-H, Random, 95% CI	Year
Saunders 1996	8	29	4	27	0.5%	1.86 [0.63, 5.48]	1996
Mui 2004	20	60	23	60	2.3%	0.87 [0.54, 1.41]	2004
Byun 2009	47	103	36	102	4.6%	1.29 [0.92, 1.81]	2009
Lee 2010	20	58	15	58	1.7%	1.33 [0.76, 2.34]	2010
Corte 2012	130	303	107	298	13.2%	1.19 [0.98, 1.46]	2012
de Brouwer 2012	190	340	200	334	31.6%	0.93 [0.82, 1.06]	2012
Rondonotti 2013	78	202	74	200	8.3%	1.04 [0.81, 1.34]	2013
Dinc 2016	17	60	18	61	1.7%	0.96 [0.55, 1.68]	2016
Ristikankare 2016	45	74	46	75	8.0%	0.99 [0.77, 1.28]	2016
Dos Santos 2017	145	220	142	220	28.2%	1.02 [0.89, 1.17]	2017
Total (95% CI)		**1449**		**1435**	**100.0%**	**1.03 [0.95, 1.10]**	
Total events	700		665				

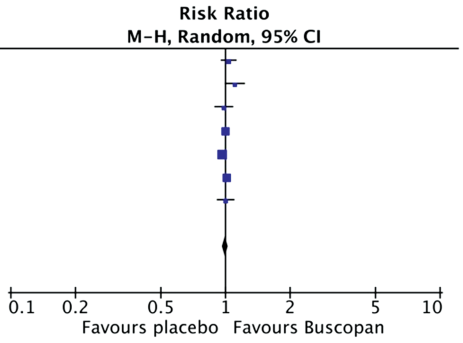
Heterogeneity: Tau² = 0.00; Chi² = 8.92, df = 9 (P = 0.44); I² = 0%
Test for overall effect: Z = 0.70 (P = 0.48)



B)

Study or Subgroup	Buscopan Events	Total	Placebo Events	Total	Weight	Risk Ratio M-H, Random, 95% CI	Year
Marshall 1999	54	56	55	59	8.0%	1.03 [0.95, 1.13]	1999
Yoong 2004	59	61	49	56	5.3%	1.11 [0.99, 1.23]	2004
Mui 2004	55	60	56	60	6.0%	0.98 [0.89, 1.09]	2004
Chaptini 2008	50	50	50	50	22.4%	1.00 [0.96, 1.04]	2008
de Brouwer 2012	322	340	328	334	28.1%	0.96 [0.94, 0.99]	2012
Ristikankare 2016	74	74	74	75	23.4%	1.01 [0.98, 1.05]	2016
Dinc 2016	69	75	68	74	6.7%	1.00 [0.91, 1.10]	2016
Total (95% CI)		**716**		**708**	**100.0%**	**1.00 [0.97, 1.03]**	
Total events	683		680				

Heterogeneity: Tau² = 0.00; Chi² = 9.85, df = 6 (P = 0.13); I² = 39%
Test for overall effect: Z = 0.00 (P = 1.00)



C)

Study or Subgroup	Buscopan Mean	SD	Total	Placebo Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI	Year
Saunders 1996	13	4.25	29	17.5	6.5	27	4.2%	-4.50 [-7.40, -1.60]	1996
Marshall 1999	11.6	8.1	57	15.1	10.4	59	3.2%	-3.50 [-6.89, -0.11]	1999
Mui 2004	12.2	6.96	60	9.74	5.6	60	6.2%	2.46 [0.20, 4.72]	2004
Yoong 2004	9.7	6.125	61	8.3	7.95	56	5.0%	1.40 [-1.19, 3.99]	2004
Chaptini 2008	5.7	2.5	50	5.9	2.8	50	14.7%	-0.20 [-1.24, 0.84]	2008
Corte 2012	9.5	6.96	303	10	6.74	298	14.1%	-0.50 [-1.60, 0.60]	2012
Rondonotti 2013	5.9	3.8	202	6.3	4.3	200	17.4%	-0.40 [-1.19, 0.39]	2013
Ristikankare 2016	9.3	0.7	74	10.2	0.6	75	22.8%	-0.90 [-1.11, -0.69]	2016
Dinc 2016	10	3	60	11	4	61	12.5%	-1.00 [-2.26, 0.26]	2016
Total (95% CI)			**896**			**886**	**100.0%**	**-0.58 [-1.23, 0.08]**	

Heterogeneity: Tau² = 0.48; Chi² = 22.92, df = 8 (P = 0.003); I² = 65%
Test for overall effect: Z = 1.73 (P = 0.08)

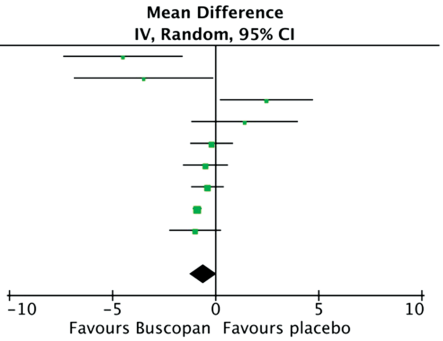


Figure 2. Forest plot comparing use of Buscopan versus placebo in terms of (A) polyp detection rate (PDR), (B) cecal intubation rate (CIR), and (C) cecal intubation time (CIT) in minutes, using data from randomized controlled studies in patients undergoing colonoscopy. I_2 = 0% (95% CI = 0% to 61%).

ERCP

Far fewer studies are available regarding the use of Buscopan in ERCP. Our review revealed a 2017 RCT comparing Buscopan to the combination of glucagon and nitroglycerin during ERCP in 455 patients. The Buscopan group experienced significantly lower cannulation success, higher cannulation times and higher rates of post-ERCP pancreatitis (PEP), but this study was limited by the lack of a placebo arm, and therefore, it is difficult to draw conclusions regarding the efficacy of Buscopan compared to no intervention (21). A 2007 RCT assessed whether the addition of preprocedural sublingual Buscopan (versus placebo) reduced the amount of 'rescue' glucagon required to reduce peristalsis during the procedure. No significant differences were observed between groups in the amount of glucagon required, success rates or AE rates (22); however, it is again difficult to draw conclusions regarding Buscopan's efficacy based on the study design that utilized 'rescue' glucagon, especially given that parametric statistical tests were incorrectly used to compare the amount of 'rescue' glucagon for a strongly skewed distribution due to a large proportion of patients receiving zero amount (evident from the fact that the standard deviation was larger than the mean value). A 1997 RCT comparing Buscopan directly to glucagon found no significant differences in procedural difficulty between groups, with significantly lower costs associated with Buscopan (23). Two

Table 1. Incidence of tachycardia from studies comparing Buscopan to placebo

Author, year	Buscopan		Placebo		Definition of tachycardia
	Events/number of participants	Mean HR before→after (number of participants)	Events/number of participants	Mean HR before→after (number of participants)	
Saunders 1996 *	0/29		0/27		Not defined
Mui 2004	33/60		2/60		HR > 100 for any duration
Byun 2009		HR increased, '$P = 0.000$' ($n = 103$)		Implied that HR was not increased ($n = 102$)	N/A
Corte 2012	1/303		0/298		Not defined
Rondonotti 2013	6/202		1/200		HR > 140 for more than 30 sec
De Brouwer 2012	0/340		0/334		HR > 120 for any duration
Dinc 2016		76 → 100 ($n = 60$)		82 → 81 ($n = 61$)	N/A
Ristikankare 2016	13/74		0/75		HR > 120, duration undefined
Dos Santos 2017	3/220		0/220		HR > 140 for any duration
Marshall 1999	10/37		1/33		HR > 100 for any duration
Yoong 2004 *	0/61		0/56		Not defined
Chaptini 2008		77→ 81, 'nonsignificant' $n = 50$		79 → 83 $n = 50$	N/A
Misra 2007		86→ 93, '$P < 0.01$' $n = 100$		86 → 87 $n = 100$	N/A
Total events (unweighted)	66/1326		4/1303		

HR, heart rate; N/A, not applicable.

*Two studies did not clearly set out to measure AEs a priori—simply mentioned 'no AEs' in the text.

other RCTs have also reported similar performances between Buscopan and glucagon for ERCP (3,24). Of note, meta-analysis was not performed of these latter three studies given significant differences in study designs and outcome measures.

Overall, the evidence for the efficacy of Buscopan compared to placebo in ERCP was not sufficient to inform the direction of a recommendation. However, there is low to moderate certainty of evidence that Buscopan and glucagon have comparable efficacy in ERCP. By way of a post hoc decision, we utilized a nonquantitative network approach to obtain indirect evidence. We performed a supplementary literature search in PubMed for RCTs comparing glucagon to placebo in ERCP on August 15, 2021. We identified one RCT (published in abstract form) that compared two different glucagon dosing methods (drip infusion during the procedure or single dose of 1 mg at the time of scope insertion) to placebo and found significantly higher cannulation success rates without the need for additional glucagon dosing in the glucagon groups (98% in the drip infusion group, 92% in the single dose group and 38% in the placebo group) (25). Therefore, there is direct evidence of superior performance of glucagon compared to placebo, and direct evidence of similar performances between Buscopan and glucagon. Through a non-quantitative network approach and the assumption of transitivity, this constitutes indirect evidence that Buscopan is likely superior to placebo for the outcomes of reduced peristalsis and cannulation success during ERCP.

It should be noted that currently, Buscopan is commonly used during ERCP when peristalsis is interfering with successful cannulation, given that cannulation-related adverse events are well-established (26,27). Thus, most conservative and relatively low-cost interventions are frequently employed if there is direct or indirect evidence they can serve to mitigate these AEs. The collective (unpublished) experience of the panel members who perform ERCP (N.F., M.B., FT) confirm that Buscopan appears to inhibit duodenal motiltiy and improve the view of the papilla during ERCP.

GASTROSCOPY

Based on our review, scarce evidence exists assessing Buscopan's impact on upper endoscopic procedures, which is understandable given the relatively short associated procedure time combined with a lack of need for prolonged close mucosal inspection or fine endoscope and/or instrument control. In a recent large propensity-matched observational study, Buscopan use during upper endoscopy was not associated with improved detection of esophageal, gastric or duodenal neoplasia, adenoma or cancer (28). Furthermore, an observational study

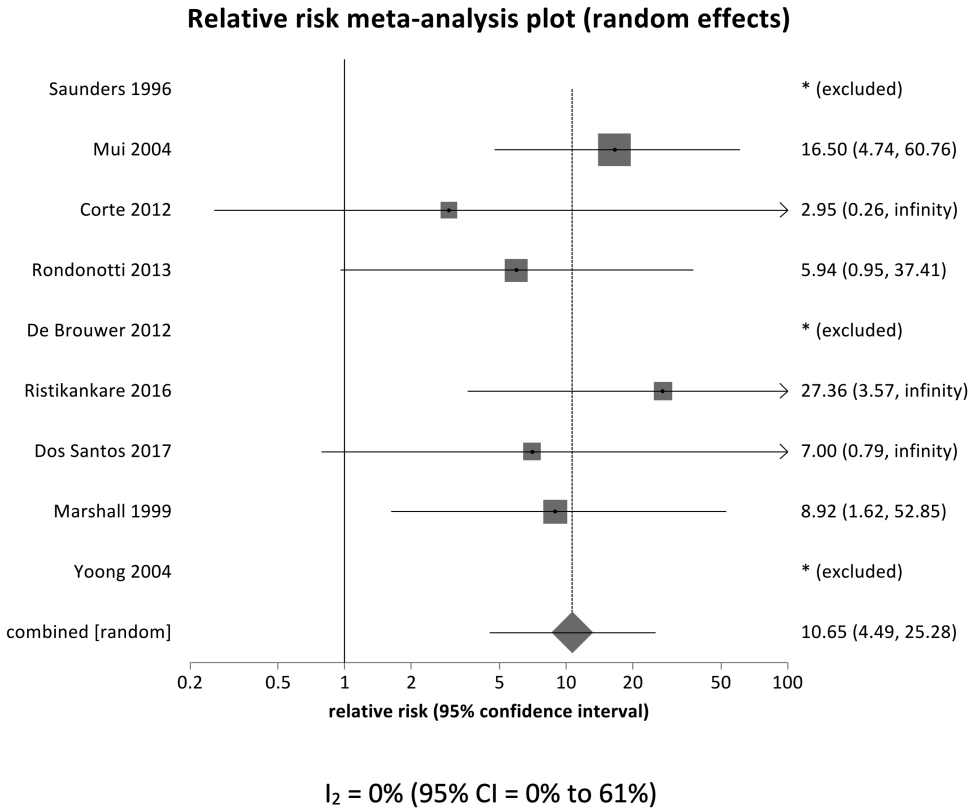


Figure 3. Forest plot comparing use of Buscopan versus placebo in terms of tachycardia, using data from randomized controlled studies in patients undergoing colonoscopy.

Table 2. Summary of review articles reporting adverse events associated with Buscopan use in other populations

Author, year	Systematic or narrative review	Population	Indirectness of the population	Additional contributors to indirectness	AEs studied
Aboshama 2020	SR	Women of childbearing age undergoing hysterosalpingography for infertility	Not serious	-	nausea/vomiting, dizziness
Mohaghegh 2020	SR	Women in active phase of labor	Serious	-	Tachychardia, dry mouth
Rohwer 2013	SR	Women in active phase of labor	Serious	-	Tachycardia
Martinez-Vazquez 2012	SR	IBS patients	Not serious	Oral route; daily administration for several weeks	All AEsreported together (not separated) (one study only)
Ford 2008	SR	IBS patients	Not serious	Oral route; daily administration for several weeks	Not pooled (too few)
Tytgat 2008	Narrative	Abdominal spasm and peri-procedural	Not serious		Visual disturbance, tachychardia
Tytgat 2007	Semi-narrative (combines two RCTs for AEs)	Abdominal pain/cramping	Not serious	Oral route; daily administration for 3–4 weeks	Extensive list based on combined AEs from two RCTs
Dyde 2008	Narrative	Radiologic procedures	Not serious	-	Arrhythmia, cardiac events, visual disturbance, glaucoma, urinary retention, myaesthenia

AE, adverse event; IBS, irritable bowel syndrome; RCT, randomized controlled trial; SR, systematic review.

from 1998 demonstrated that Buscopan use was not associated with improved patient comfort during upper endoscopy (29).

ADVERSE EVENTS

We systematically extracted data on AEs from the included RCTs that assessed Buscopan in patients undergoing colonoscopy. None of the studies reported any cases of acute glaucoma; 0/1579, 95% CI calculated with the rule of 3/n for zero events 0% to 0.2% (30). With regard to the other reported AEs, most of them were of questionable clinical importance. Furthermore, the definitions of AEs differed among studies and many of them excluded patients with cardiac comorbidities (i.e., the patients who would be more likely to suffer clinical consequences in case of an AE). The AE that was most consistently reported was tachycardia (**Table 1**). Buscopan use increased the heart rate and caused tachycardia more frequently than placebo. Meta-analysis of the results of the RCTs that reported event rates for tachycardia is presented in forest plot in **Figure 3**: RR 10.65, 95% CI 4.49 to 25.28 without heterogeneity ($I^2 = 0\%$).

Given the paucity of reported data on other adverse events in the studies that assessed Buscopan in patients undergoing endoscopic procedures, we conducted a supplementary search for systematic reviews that reported adverse events associated with Buscopan use in other populations (Supplementary Materials). We identified eight review articles, and these are summarized in **Table 2**. Given the indirectness of the populations and the intervention (oral dose and repeated dosing for several weeks in most studies), the only consistent AE was tachycardia. However, AEs have not been systematically assessed and reported in most studies.

We also conducted a search of the post-marketing surveillance programs in the United Kingdom, the United States, and Canada for serious adverse events associated with the use of

Table 3. GRADE summary of findings table (19) for randomized trials comparing Buscopan versus placebo for colonoscopy

Certainty assessment							Number of events/ patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Buscopan	Placebo	Relative(95% CI)	Absolute (95% CI)		
Polyp detection rate (PDR)												
10	Randomized trials	Not serious[a]	Not serious	Not serious	Not serious[b]	None	700/1449 (48.3%)	665/1435 (46.3%)	RR 1.03 (0.95 to 1.10)	**14 more per 1,000**(from 23 fewer to 46 more)	⨁⨁⨁⨁ HIGH	CRITICAL
Cecal intubation rate (CIR)												
7	Randomized trials	Not serious	Not serious	Not serious	Not serious[b]	None	683/716 (95.4%)	680/708 (96.0%)	RR 1.00 (0.97 to 1.03)	**0 fewer per 1,000**(from 29 fewer to 29 more)	⨁⨁⨁⨁ HIGH	IMPORTANT
Cecal intubation time (CIT)												
9	Randomized trials	Not serious	Serious[c]	Not serious	Not serious	None	Number of patients:896	Number of patients: 886	**MD 0.58 minutes lower** (1.23 lower to 0.08 higher)	N/A	⨁⨁⨁⊖ MODERATE	LIMITED IMPORTANCE
Tachycardia												
9	Randomized trials	Not serious	Not serious	Serious[d]	Not serious	None	66/1326 (5.0%)	4/1303 (0.3%)	**RR 10.65** (4.49 to 25.28	29 more per 1,000 (from 10 more to 73 more)	⨁⨁⨁⊖ MODERATE	CRITICAL

CI, confidence interval; MD, mean difference; N/A, not applicable; RR, rate ratio.

[a]Use of Buscopan may lead to unblinding of endoscopists due to tachycardia – however, it is unclear which direction in which this potential bias would influence the result, and therefore we did not downgrade for risk of bias.
[b]We did not downgrade for imprecision, because the tight 95% CI is compatible with no effect or negligible effects. The decision threshold for these recommendation is a clinically important difference, rather than 'no difference'.
[c]Clearly beneficial and clearly detrimental studies both exist, and there is substantial heterogeneity ($I^2 = 65\%$). The studies reported tachycardia defined by heart rate, which is a surrogate for serious clinical outcomes. The studies did not report the number of patients with tachycardia requiring treatment, compromizing the quality of the colonoscopy, or leading to serious clinical outcomes.

Table 4. Implications of strong and conditional recommendations according to the GRADE framework (19)

Implications	Strong recommendation	Conditional recommendation
For patients	Most individuals in this situation would want the recommended course of action and only a small proportion would not.	Most individuals in this situation would want the suggested course of action, but many would not.
For clinicians	Most individuals should receive the recommended course of action.	Different choices will be appropriate for different individuals consistent with the patient's values and preferences. Use shared-decision making.
For policy makers	The recommendation can be adopted as policy in most situations.	Policy-making will require substantial debate and involvement of various stakeholders.

Buscopan. The Drug Safety Update issued by the Medicines and Healthcare products Regulatory Agency (MHRA) in the United Kingdom reported eight deaths after receiving intravenous or intramuscular injection of Buscopan. In most of these cases, the fatal adverse events were reported as acute myocardial infarction or cardiac arrest. The Drug Safety Update emphasizes that the adverse effects of tachycardia, hypotension, and anaphylaxis can be more serious in patients with underlying cardiac disease such as heart failure, coronary heart disease, cardiac arrhythmia, or hypertension. Therefore, it is advised that Buscopan be used with caution in patients with cardiac disease (9). Pharmacovigilance data of Buscopan are not available in the United States as it does not have Food and Drug Administration (FDA) approval. A search of the Canada Vigilance Adverse Reaction Online Database did not reveal any cardiac events or deaths after the use of Buscopan. Literature search revealed a case report of buscopan-induced hypotension and myocardial ischemia during a colonoscopy (8).

RECOMMENDATIONS

CAG's recommendations regarding Buscopan use are summarized below:

1) **Colonoscopy**: CAG recommends against the use of Buscopan before or during colonoscopy (strong recommendation, high certainty of evidence). The Summary of Findings Table per GRADE approach (19) is shown in **Table 3**.
2) **Gastroscopy**: CAG suggests against the use of Buscopan before or during gastroscopy (conditional recommendation, very low certainty of evidence). Limited evidence from two observational studies did not show any beneficial effects, while the AE profile would be similar to patients receiving Buscopan for colonoscopy (Table 3).
3) **ERCP**: CAG suggests the use of Buscopan before or during ERCP (conditional recommendation, very low certainty of evidence). This was based on indirect evidence of superior performance of Buscopan compared to placebo in reducing small bowel peristalsis and optimizing the view of the papilla during ERCP since the stakes in achieving cannulation and biliary drainage are high.

As per the GRADE framework, a strong recommendation means that the panel is very confident that the benefits of following the recommendation clearly outweigh the harms (or vice versa), so the course of action should apply to most patients. A conditional recommendation is one for which the panel concludes that the desirable effects of adherence to a recommendation probably outweigh the undesirable effects (or vice versa), but the panel is not confident about these tradeoffs due to low or very low certainty of evidence, uncertainty regarding the balance of benefits and harms, uncertainty or variability in patients' values and preferences, and/or questionable cost-effectiveness (see **Table 4** for a summary of this rationale as it applies to various stakeholders). We do not have evidence to help us define the circumstances under which 'as needed' buscopan may be of benefit. Further research will help clarify what these circumstances are, but it is conceivable that buscopan may be of benefit in the setting of strong and persistent peristalsis to improve mucosal visualization and safety of therapeutic interventions.

More research is needed to determine whether patients undergoing advanced procedures such as EMR and/or ESD benefit from the use of Buscopan. Buscopan should be used with caution in patients with cardiac comorbidities. According to its product monograph, Buscopan is contraindicated in patients with tachycardia, angina and cardiac failure (31). Thus, Buscopan should be used very cautiously in patients with these conditions, and only when the potential benefits of its use outweigh the potential risks in a particular case (e.g., in a patient with acute cholangitis requiring urgent biliary decompression). Such patients require careful cardiac monitoring in an environment where resuscitation equipment and appropriately trained staff to use it are readily available. According to its product monograph, Buscopan is also contraindicated in patients with prostatic hypertrophy with urinary retention (31), and therefore, should be used very cautiously in such patients as well, and only when the potential benefits of its use outweigh the potential risks in a particular case.

Obtaining a preprocedural history of glaucoma is unlikely to be of value when considering Buscopan use. However, in cases where Buscopan has been used, patients should be counselled

postprocedurally and told to present to an emergency facility should they experience eye pain, redness, decreased vision, nausea and vomiting, or headache.

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AUTHOR CONTRIBUTIONS

Conception and design: F.T., M.B., N.F.; Analysis and interpretation of the data: all authors; Drafting of the article: N.F., F.T., G.I.L.; Critical revision of the article for important intellectual content: all authors; Final approval of the article: all authors.

CONFLICT OF INTEREST

None declared.

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