ISSN 1007-9327 (print)
ISSN 2219-2840 (online)

World Journal of *Gastroenterology*

World J Gastroenterol 2022 April 28; 28(16): 1608-1724

Published by Baishideng Publishing Group Inc

World Journal of Gastroenterology

Contents

Weekly Volume 28 Number 16 April 28, 2022

THERAPEUTIC AND DIAGNOSTIC GUIDELINES

REVIEW

ORIGINAL ARTICLE

Basic Study

Retrospective Cohort Study

Retrospective Study

SYSTEMATIC REVIEWS

LETTER TO THE EDITOR

World Journal of Gastroenterology

Weekly Volume 28 Number 16 April 28, 2022

Contents

ABOUT COVER

Editorial Board Member of *World Journal of Gastroenterology*, Mauro Bortolotti, MD, Gastroenterologist, Internist, Former Director of 1st level and contract Professor at the Department of Internal Medicine and Gastroenterology of the S.Orsola-Malpighi Polyclinic, University of Bologna, via Massarenti 9, Bologna 40138, Italy. bormau@tin.it

AIMS AND SCOPE

The primary aim of *World Journal of Gastroenterology* (*WJG*, *World J Gastroenterol*) is to provide scholars and readers from various fields of gastroenterology and hepatology with a platform to publish high-quality basic and clinical research articles and communicate their research findings online. *WJG* mainly publishes articles reporting research results and findings obtained in the field of gastroenterology and hepatology and covering a wide range of topics including gastroenterology, hepatology, gastrointestinal endoscopy, gastrointestinal surgery, gastrointestinal oncology, and pediatric gastroenterology.

INDEXING/ABSTRACTING

The *WJG* is now indexed in Current Contents®/Clinical Medicine, Science Citation Index Expanded (also known as SciSearch®), Journal Citation Reports®, Index Medicus, MEDLINE, PubMed, PubMed Central, and Scopus. The 2021 edition of Journal Citation Report® cites the 2020 impact factor (IF) for *WJG* as 5.742; Journal Citation Indicator: 0.79; IF without journal self cites: 5.590; 5-year IF: 5.044; Ranking: 28 among 92 journals in gastroenterology and hepatology; and Quartile category: Q2. The *WJG*'s CiteScore for 2020 is 6.9 and Scopus CiteScore rank 2020: Gastroenterology is 19/136.

RESPONSIBLE EDITORS FOR THIS ISSUE

Production Editor: *Hua-Ge Yu*; **Production Department Director:** *Xu Guo*; **Editorial Office Director:** *Ze-Mao Gong*.

NAME OF JOURNAL

World Journal of Gastroenterology

ISSN

ISSN 1007-9327 (print) ISSN 2219-2840 (online)

LAUNCH DATE

October 1, 1995

FREQUENCY

Weekly

EDITORS-IN-CHIEF

Andrzej S Tarnawski

EDITORIAL BOARD MEMBERS

http://www.wjgnet.com/1007-9327/editorialboard.htm

PUBLICATION DATE

April 28, 2022

COPYRIGHT

© 2022 Baishideng Publishing Group Inc

INSTRUCTIONS TO AUTHORS

https://www.wjgnet.com/bpg/gerinfo/204

GUIDELINES FOR ETHICS DOCUMENTS

https://www.wjgnet.com/bpg/GerInfo/287

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH

https://www.wjgnet.com/bpg/gerinfo/240

PUBLICATION ETHICS

https://www.wjgnet.com/bpg/GerInfo/288

PUBLICATION MISCONDUCT

https://www.wjgnet.com/bpg/gerinfo/208

ARTICLE PROCESSING CHARGE

https://www.wjgnet.com/bpg/gerinfo/242

STEPS FOR SUBMITTING MANUSCRIPTS

https://www.wjgnet.com/bpg/GerInfo/239

ONLINE SUBMISSION

https://www.f6publishing.com

© 2022 Baishideng Publishing Group Inc. All rights reserved. 7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA

E-mail: bpgoffice@wjgnet.com https://www.wjgnet.com

World Journal of Gastroenterology

Submit a Manuscript: https://www.f6publishing.com

World J Gastroenterol 2022 April 28; 28(16): 1722-1724

DOI: 10.3748/wjg.v28.i16.1722

ISSN 1007-9327 (print) ISSN 2219-2840 (online)

LETTER TO THE EDITOR

Comment on "Artificial intelligence in gastroenterology: A state-of-the-art review"

Thomas Bjørsum-Meyer, Anastasios Koulaouzidis, Gunnar Baatrup

Specialty type: Gastroenterology and hepatology

Provenance and peer review: Unsolicited article; Externally peer reviewed.

Peer-review model: Single blind

Peer-review report's scientific quality classification

Grade A (Excellent): 0
Grade B (Very good): B
Grade C (Good): C
Grade D (Fair): 0
Grade E (Poor): 0

P-Reviewer: Laskaratos FM, United Kingdom; Oh CK, South Korea

Received: December 1, 2021
Peer-review started: December 1, 2021
First decision: December 26, 2021
Revised: January 7, 2022
Accepted: March 16, 2022
Article in press: March 16, 2022
Published online: April 28, 2022

Thomas Bjørsum-Meyer, Gunnar Baatrup, Department of Surgery, Odense University Hospital, Svendborg 5700, Denmark

Thomas Bjørsum-Meyer, Anastasios Koulaouzidis, Gunnar Baatrup, Department of Clinical Research, University of Southern Denmark, Faculty of Health Science, Odense 5230, Denmark

Corresponding author: Thomas Bjørsum-Meyer, MD, PhD, Associate Professor, Surgeon, Department of Surgery, Odense University Hospital, Baagøes Alle 15, Svendborg 5700, Denmark. thomas.bjoersum-meyer@rsyd.dk

Abstract

Colon capsule endoscopy (CCE) was introduced nearly two decades ago. Initially, it was limited by poor image quality and short battery time, but due to technical improvements, it has become an equal diagnostic alternative to optical colonoscopy (OC). Hastened by the coronavirus disease 2019 pandemic, CCE has been introduced in clinical practice to relieve overburdened endoscopy units and move investigations to out-patient clinics. A wider adoption of CCE would be bolstered by positive patient experience, as it offers a diagnostic investigation that is not inferior to other modalities. The shortcomings of CCE include its inability to differentiate adenomatous polyps from hyperplastic polyps. Solving this issue would improve the stratification of patients for polyp removal. Artificial intelligence (AI) has shown promising results in polyp detection and characterization to minimize incomplete CCEs and avoid needless examinations. Onboard AI appears to be a needed application to enable near-real-time decision-making in order to diminish patient waiting times and avoid superfluous subsequent OCs. With this letter, we discuss the potential and role of AI in CCE as a diagnostic tool for the large bowel.

Key Words: Video capsule endoscopy; Wireless capsule endoscopy; Artificial intelligence; Colonic polyps; Endoscopic surgical procedures; Colon neoplasm

©The Author(s) 2022. Published by Baishideng Publishing Group Inc. All rights reserved.

Core Tip: Colon capsule endoscopy (CCE) generates a vast amount of image material-currently, this material must be assessed manually. Artificial intelligence (AI) as an adjunct to CCE has been reported as having high accuracy for detecting colonic lesions. Future studies need to evaluate AI algorithms for estimating the likelihood of neoplasia and predicting which patients are most likely to benefit from CCE. Onboard capsule intelligence has the potential to generate result reports immediately after completed examinations.

Citation: Bjørsum-Meyer T, Koulaouzidis A, Baatrup G. Comment on "Artificial intelligence in gastroenterology: A state-of-the-art review". *World J Gastroenterol* 2022; 28(16): 1722-1724
URL: https://www.wjgnet.com/1007-9327/full/v28/i16/1722.htm
DOI: https://dx.doi.org/10.3748/wjg.v28.i16.1722

TO THE EDITOR

We read with interest the in-depth review by Kröner *et al*[1]. The authors presented a thorough account of the status and knowledge of artificial intelligence (AI) in everyday practice in gastroenterology[1]. As we apply AI in picture analysis of colon capsule endoscopy (CCE), we feel obliged to offer some relevant insights. The coronavirus disease 2019 (COVID-19) pandemic has accelerated the clinical adoption of CCE as an alternative first-line diagnostic procedure to optical colonoscopy (OC)[2]. CCE is a painless, low-risk procedure that can be performed in the patient's home with minimal contact with healthcare workers and/or other patients, therefore abiding (when possible) by the distancing measures recommended to contain the spread of COVID-19.

Furthermore, CCE is seen as a measure to relieve the pressure on overburdened endoscopy units with long waiting times for OC. The Scottish Capsule Programme has implemented CCE in a large-scale roll-out to patients presenting with lower gastrointestinal symptoms to their general practitioners and found to be eligible for colonic investigation[3]. The programme enables effective upfront screening at the community level to address increasing demand and capacity pressure within the National Health Service.

Until recently, the clinical implementation of CCE has been hampered by low completion rates compared to OC. A significant drawback for CCE is its reliance on extensive orally administered bowel cleansing preparations to gain adequate visualization of the mucosa, as, unlike OC, water wash and suction are not possible. Although research into optimizing and standardizing bowel preparation regimens is ongoing, to date it has failed to meet the minimum standard of 90% for OC[4]. A recent systematic review and meta-analysis of 46 studies including 5000 patients showed that CCE's (pooled) adequate colon cleanliness rate (ACCR) was only 77%[5]. Therefore, further studies aiming to improve CCE's ACCR are mandatory. Another way to achieve more conclusive CCE examinations is to enhance our ability to predict patients at high risk of an insufficient colon cleanliness level. AI algorithms based on demographic data are one possible solution. We are currently running a large randomized trial in Denmark (CFC2015) in which 2015 citizens are allocated to CCE. After the study is completed in Summer 2022, we plan to create algorithms for just such a purpose. The cost-effectiveness of CCE needs to be improved before wider clinical adoption is considered. Hassan *et al*[6] found that improved compliance in the general population is mandatory to make CCE cost-effective compared to OC[6].

CCE produces many images, and reading them is very time-consuming and monotonous, increasing the risk of missing important lesions. Hence, the development of AI-based tools to assist readers is needed. Saraiva *et al*[7], in a recent article, developed a convolutional neural network based on AI. They found that it could detect protruding lesions in the colon with a sensitivity of 90.7% and a specificity of 92.6%[7]. To avoid unnecessary OC after CCE, it is essential to differentiate between hyperplastic polyps (HPs) and adenomatous polyps (APs). By applying flexible spectral imaging colour enhancement, Nakazawa *et al*[8] differentiated HPs from APs with a sensitivity of 91.2% and specificity of 88.2%[8]. Further research is needed to detect sessile serrated lesions using AI-assisted CCE.

The delay between capsule egestion and the completion of video reading and report writing is currently two days. Onboard capsule intelligence has the potential to make near real-time assessments of colonic pathology, creating a report almost immediately after CCE completion. The authors of this letter aspire to the development of onboard integrated AI to make CCE an expeditious diagnostic tool comparable to OC.

FOOTNOTES

Author contributions: Bjørsum-Meyer T conceived of the idea for the manuscript and contributed to the manuscript drafting and critical revision; Koulaouzidis A and Baatrup G contributed to the manuscript drafting and critical

revision.

Conflict-of-interest statement: AK is consultant for Jinshan. He is director of iCERV Ltd and cofounder of AJM Medicaps Ltd. He has received a GivenImaging Ltd-ESGE grant, and material support for clinical research from SynMed/Intromedic. In the last ten years, he has received honoraria & lecture fees from Jinshan, Dr FalkPharma UK and Ferring. He has also received educational travel support from Aquilant, Jinshan, Dr FalkPharma, Almirall, Ferring, and has participated in advisory board meetings for Tillots, Ankon, and Dr FalkPharmaUK.

Open-Access: This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: https://creativecommons.org/Licenses/by-nc/4.0/

Country/Territory of origin: Denmark

ORCID number: Thomas Bjørsum-Meyer 0000-0001-5253-0802; Anastasios Koulaouzidis 0000-0002-2248-489X; Gunnar Baatrup 0000-0003-0300-5766.

S-Editor: Fan JR
L-Editor: A
P-Editor: Fan JR

REFERENCES

1 **Kröner PT**, Engels MM, Glicksberg BS, Johnson KW, Mzaik O, van Hooft JE, Wallace MB, El-Serag HB, Krittanawong C. Artificial intelligence in gastroenterology: A state-of-the-art review. *World J Gastroenterol* 2021; **27**: 6794-6824 [PMID: 34790008 DOI: 10.3748/wjg.v27.i40.6794]
2 **MacLeod C**, Wilson P, Watson AJM. Colon capsule endoscopy: an innovative method for detecting colorectal pathology during the COVID-19 pandemic? *Colorectal Dis* 2020; **22**: 621-624 [PMID: 32403190 DOI: 10.1111/codi.15134]
3 **ScotCap Clinical Leads Collaboration**. Follow-up of small and diminutive colonic polyps-How to balance the risks in the COVID-19 era. *Colorectal Dis* 2021; **23**: 3061-3064 [PMID: 34510684 DOI: 10.1111/codi.15907]
4 **Hassan C**, East J, Radaelli F, Spada C, Benamouzig R, Bisschops R, Bretthauer M, Dekker E, Dinis-Ribeiro M, Ferlitsch M, Fuccio L, Awadie H, Gralnek I, Jover R, Kaminski MF, Pellisé M, Triantafyllou K, Vanella G, Mangas-Sanjuan C, Frazzoni L, Van Hooft JE, Dumonceau JM. Bowel preparation for colonoscopy: European Society of Gastrointestinal Endoscopy (ESGE) Guideline - Update 2019. *Endoscopy* 2019; **51**: 775-794 [PMID: 31295746 DOI: 10.1055/a-0959-0505]
5 **Bjoersum-Meyer T**, Skonieczna-Zydecka K, Cortegoso Valdivia P, Stenfors I, Lyutakov I, Rondonotti E, Pennazio M, Marlicz W, Baatrup G, Koulaouzidis A, Toth E. Efficacy of bowel preparation regimens for colon capsule endoscopy: a systematic review and meta-analysis. *Endosc Int Open* 2021; **9**: E1658-E1673 [PMID: 34790528 DOI: 10.1055/a-1529-5814]
6 **Hassan C**, Zullo A, Winn S, Morini S. Cost-effectiveness of capsule endoscopy in screening for colorectal cancer. *Endoscopy* 2008; **40**: 414-421 [PMID: 18302080 DOI: 10.1055/s-2007-995565]
7 **Saraiva MM**, Ferreira JPS, Cardoso H, Afonso J, Ribeiro T, Andrade P, Parente MPL, Jorge RN, Macedo G. Artificial intelligence and colon capsule endoscopy: development of an automated diagnostic system of protruding lesions in colon capsule endoscopy. *Tech Coloproctol* 2021; **25**: 1243-1248 [PMID: 34499277 DOI: 10.1007/s10151-021-02517-5]
8 **Nakazawa K**, Nouda S, Kakimoto K, Kinoshita N, Tanaka Y, Tawa H, Koshiba R, Naka Y, Hirata Y, Ota K, Kawakami K, Takeuchi T, Inoue T, Miyazaki T, Sanomura M, Nakamura S, Saito Y, Higuchi K. The Differential Diagnosis of Colorectal Polyps Using Colon Capsule Endoscopy. *Intern Med* 2021; **60**: 1805-1812 [PMID: 33456043 DOI: 10.2169/internalmedicine.6446-20]

Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-3991568
E-mail: bpgoffice@wjgnet.com
Help Desk: https://www.f6publishing.com/helpdesk
https://www.wjgnet.com

© 2022 Baishideng Publishing Group Inc. All rights reserved.