Quality Indicators of Colonoscopy: Are we meeting the standards in Nepal?

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Abstract

Background: Colonoscopy is an important tool for management of colorectal disorders. Performance of quality colonoscopy requires a trained endoscopist, adequate resources, preparation and evaluation parameters for good outcomes. We conducted this study to emphasize the importance of quality practice in colonoscopy in our country as there is lack of standardization.

Methods: This is a retrospective observational study done at a referral center in Western Nepal. All the colonoscopies were done without sedation with two sachets of peglec powder 137.15 grams, each containing polyethylene glycol (118grams) dissolved in 2 liters of clean water each. Data of 1052 colonoscopies done during three years were retrieved from colonoscopy record section and analysed for important quality measures in use. Data entry and analysis was done in Microsoft Excel.

Results: A total of 1052 colonoscopies were included in this study. Pain abdomen (70.6%) was the commonest indication for colonoscopy and majority were male patients (53.4%). Good bowel preparation was achieved by split dosing of commercially available polyethylene glycol. Cecal and ileal intubation was achieved in 98% and 96% colonoscopies respectively, meeting the current recommendations set by the gastroenterology societies. No major complications occurred during the procedure.

Conclusion: Important quality indicators could be achieved with colonoscopy done without sedation in resource limited settings also. Screening colonoscopy should be promoted for early detection and management of colorectal cancers in low-income countries like Nepal. Quality should be standardized and practiced in routine colonoscopy examination taking into consideration of patient comfort.

Introduction

Colonoscopy is a common procedure for evaluation of lower gastrointestinal symptoms and has a diagnostic and therapeutic role for management of colonic pathologies.[1] It is safe, accurate and a well-tolerated procedure. The examination of whole colonic mucosa including the terminal ileum is possible in a single setting. Screening colonoscopy has a survival benefit with 67% reduction of death from colorectal cancer.[2] Despite advances in colonoscopy techniques and improvisation in pathology detection methods, the modern colonoscopy still remains provider dependent thus leading to differences in clinical interpretation and outcomes.[3]

Successful colonoscopy requires an adequate bowel preparation to visualize the whole colonic mucosa, thus improving lesion detection and perform required therapy if needed along with patient acceptance and comfort without any complications. Among many preparation scales, the standard in use is Boston bowel preparation scale (BBPS); score ranges from 0 (minimum) to 9 (maximum) with the threshold total score of ≥ 6 and ≥ 2 per segment of the colon.[4]

Various guidelines: European Society of Gastrointestinal Endoscopy (ESGE), the American College of Gastroenterology (ACG) and the American Society for Gastrointestinal Endoscopy (ASGE) have emphasized the use of standard quality practices to improve the overall patient outcome during coloscopy.[5,6] Among many, the most widely used quality indicators include: Boston Bowel Preparation Scale (BBPS) >6 in > 90% of all colonoscopies, cecal intubation rate (CIR) >90% for all colonoscopies[6], adenoma detection rate (ADR) >25% (male >30%: female>20%) in all screening colonoscopies age >50 years[7] and colonoscopy withdrawal time of minimum 6 minutes for negative colonoscopies.[8]

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Incorporating high-quality colonoscopy approaches, application of advanced colonoscopy techniques such as high-definition colonoscopy, hood-assisted colonoscopy and dye-based chromoendoscopy improves the lesion detection and ensures complete removal of small and flat-type colorectal polyps.[3,9] It is estimated that up to 25% of polyps are missed during colonoscopy and almost 8% CRC are detected within 3 years of previous colonoscopy examination due to failure of quality examination.[6] Hence it is important to use important colonoscopy standards to improve the overall outcome of colonoscopy.

Measuring patient comfort is important assessment tool for quality of colonoscopy. Motivated patients can undergo the procedure without sedation and use of carbon dioxide insufflation, water-aided colonoscopy, smaller diameter scopes and comfortable positions improve the outcome.[10] The best colonoscopists have a higher cecal intubation rate, use less sedation, cause less discomfort and find more polyps.[11]

In Nepal, colonoscopy facility is available in limited referral centers with wide variation in indication for examination, bowel preparation techniques, examination time, service provider and histology reporting. Screening colonoscopy is not yet implemented from public health regulatory bodies. Here we have assessed the important quality measures to assess our colonoscopy examination standards.

Materials and Methods

This is a retrospective observational study carried out at Fewa City Hospital, Pokhara, a referral center in Western Nepal. Data of colonoscopy were collected between April 2020 to March 2023 (3years) from electronic record section of endoscopy suite.

Bowel was prepared using two sachets of peglec powder 137.15 grams, each containing polyethylene glycol (118grams) dissolved in 2 liters of clean water each. First preparation was taken over 2 hours duration, the day before and other preparation was taken on the morning over 2 hours duration on procedure day completed at least 4 hours before colonoscopy examination. All the relevant colonoscopy examination details along with histology examination record (if applicable) were recorded in a prespecified proforma. Patients with incomplete colonoscopy procedure, sigmoidoscopy examination, repeat bowel preparation, reexamination and incomplete colonoscopy records were excluded from study. Information regarding age, gender, clinical indication for procedure, Boston bowel preparation score, cecal intubation, ileal intubation, bowel perforation if any and average scope withdrawal time for all normal colonoscopy examinations were recorded. Cecal intubation was defined by ability to reach and demonstrate the cecal landmarks and ileal intubation was defined by ability to reach terminal ileum. Data entry and analysis was done in Microsoft Excel (Microsoft Corporation, Redmond, WA). Continuous data were expressed as mean and categorical variables as number (%).

Results

A total of 1054 among 1119 colonoscopies performed were eligible for study. 53.4% were male patients and 46.6% were females, as shown in table 1. Colonoscopy examination was performed in patients with a minimum age of 12 years upto a maximum of 97 years without sedation for all. Mean age of the population was 49.7 years.

Table 1: Age and gender distribution

Age (years)	Male	Female	Total (n, %)
<20	23	5	28 (2.6%)
20-30	67	51	118 (11.2%)
30-40	114	84	198 (18.8%)
40-50	94	87	181 (17.2%)
50-60	107	118	225 (21.3%)
60-70	69	74	143 (13.5%)
70-80	55	56	111 (10.5%)
>80	33	15	48 (4.5%)
	562 (53.4%)	490 (46.5%)	1052

Colonoscopy was performed for complains of abdominal pain and rectal bleeding in majority of patients (figure 1).
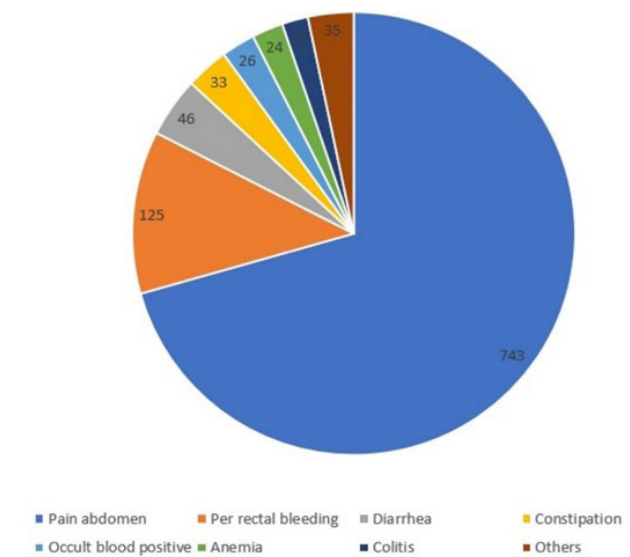

Figure 1: Indications of colonoscopy

Colonic preparation was good with BBPS of 9 in majority of patients (91%) (Table 2).

Table 2: Boston bowel preparation score

Score	Number	Frequency
6	2	0.18%
7	18	1.70%
8	75	7.11%
9	959	90.90%
Total	1054	100%

The cecal and ileal intubation rate were 98% and 96% respectively, denoting the high success of complete examination. Colonoscopy examination was normal in 389 patients (37%). Colo-rectal polyps were present in 289 patients (27.4%). (Figure 2)
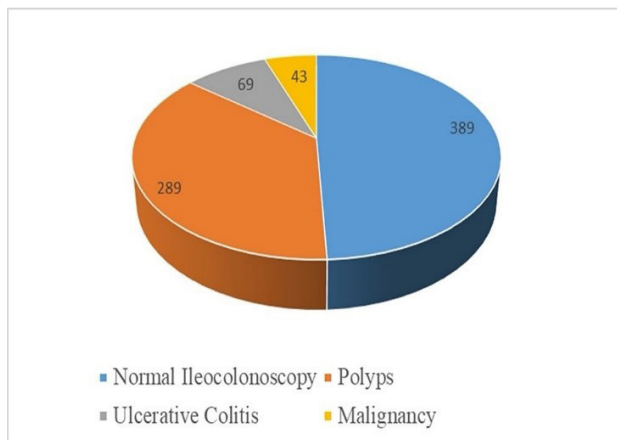

Figure 2: Findings of colonoscopy

The average scope withdrawl time was 8.5 minutes for all colonoscopies and 6.9 minutes for all normal colonoscopies.

Discussion

Current practice of this important procedure is limited to symptomatic patients in underdeveloped countries like Nepal. Colonoscopy remains a major diagnostic and therapeutic procedure for evaluation of suspected colonic lesions. Lack of awareness of benefits of screening colonoscopy, limited availability of procedure, few trained endoscopists, inability to detect and manage the colonic problems remains the major challenges in Nepal. Standardization of the procedure with routine application of key quality indicators ensures better clinical outcome, patient satisfaction and reduction of colorectal malignancies.

Gender distribution for colonoscopy examination is almost equal for both sexes in our study. Pain abdomen (71%) was the most common indication for procedure followed by per rectal bleeding (11.8%) which explains the felt need of undertaking the procedure. Among all colonoscopies performed during the three years period, 67 patients were excluded due to incomplete ileal intubation, need of repeat bowel preparation and presence of strictures.

Polyps were detected in 289 (27.4%) patients with adenoma detected only in 89 patients (8.4%). The low adenoma detection rate is probably due to failure of application of screening colonoscopies in our population as well as lack of accurate histological assessment. Ulcerative colitis was detected among 69 patients similar to national incidence[12] and colorectal malignancies was detected in 43 patients.

We have achieved BBPS of 9 in approximately 91% of colonoscopies indicating the excellent preparation using two sachets of commercially available polyethylene glycol at a slightly higher cost than many endoscopy centers using a single sachet in the country. The achievement of CIR and IIR of 98% and 96% respectively indicates a good quality of colonoscopy as compared to current guidelines.[3,14] Colonoscopy withdrawal time of average 6.9 minutes for normal studies and 8.5 minutes for all colonoscopies in our study meets the recommended examination duration.[14,15] No major complication of bowel perforation was noted.

Conclusion

Colonoscopy is a safe and most useful procedure for screening and management of colonic pathologies, yet not easily accessible to majority of Nepalese population. Public awareness should be made regarding the benefits of the procedure. Quality of colonoscopy should be standardized and implemented in our country taking into patient comfort into consideration. Polyp management and adenoma detection rate should also be assessed for benefits of screening colonoscopy. We achieved important quality indicators like good bowel preparation, cecal intubation rate and ileal intubation rate without sedation, as recommended by western societies.

Limitations

It is a retrospective, single center study. We could not accurately assess adenoma detection rate, patient's comfort and acceptance for procedure as both parameters are important quality measures of colonoscopy.

References

1. Rees CJ, Bevan R, Zimmermann-Fraedrich K, Rutter MD, Rex D, Dekker E, et al. Expert opinions and scientific evidence for colonoscopy key performance indicators. Gut. 2016 Dec 1;65(12):2045–60. https://doi.org/10.1136/gutjnl-2016-312043

2. Doubeni CA, Corley DA, Quinn VP, Jensen CD, Zauber AG, Goodman M, et al. Effectiveness of screening colonoscopy in reducing the risk of death from right and left colon cancer: a large community-based study. Gut. 2018 Feb;67(2):291-298. doi: 10.1136/gutjnl-2016-312712. Epub 2016 Oct 12. PMID: 27733426; PMCID: PMC5868294.

3. Soeder M, Turshudzhyan A, Rosenberg L, Tadros M. High-Quality Colonoscopy: A Review of Quality Indicators and Best Practices. Gastroenterology Insights. 2022; 13(2):162-172. https://doi.org/10.3390/gastroent13020017

4. Kastenberg D, Bertiger G, Brogadir S. Bowel preparation quality scales for colonoscopy. World J Gastroenterol. 2018 Jul 14;24(26):2833-2843. doi: 10.3748/wjg.v24.i26.2833. PMID: 30018478; PMCID: PMC6048432.

5. Karamaroudis S, Stamou A, Vorri SC, Gkolfakis P, Papadopoulos V, Tziatzios G, et al. Monitoring of colonoscopy quality indicators in an academic endoscopy facility reveals adherence to international recommendations. Ann Transl Med. 2018 Jul;6(13):263. doi: 10.21037/atm.2018.03.34. PMID: 30094249; PMCID: PMC6064800.

6. Pullens HJ, Siersema PD. Quality indicators for colonoscopy: Current insights and caveats. World J Gastrointest Endosc. 2014 Dec 16;6(12):571-83. doi: 10.4253/wjge.v6.i12.571. PMID: 25512766; PMCID: PMC4265954.

7. Rex DK. Key quality indicators in colonoscopy. Gastroenterol Rep (Oxf). 2023 Mar 10;11:goad009. doi: 10.1093/gastro/goad009. PMID: 36911141; PMCID: PMC10005623.

8. Barclay RL, Vicari JJ, Doughty AS, Johanson JF, Greenlaw RL, Rockford Gastroenterology Associ-ates RLB F, et al. Colonoscopic Withdrawal Times and Adenoma Detection during Screening Colonoscopy. N Engl J Med. 2006 Dec 14;355(24):2533-41. doi: 10.1056/NEJMoa055498. PMID: 17167136.

9. Horiuchi A, Tanaka N. Improving quality measures in colonoscopy and its therapeutic intervention. World J

Gastroenterol. 2014 Sep 28;20(36):13027-34. doi: 10.3748/wjg. v20.i36.13027. PMID: 25278696; PMCID: PMC4177481.

10. Brown S, Whitlow CB. Patient comfort during colonoscopy. Semin Colon Rectal Surg. 2017 Mar 1;28(1):1–3.

11. Ekkelenkamp VE, Dowler K, Valori RM, Dunckley P. Patient comfort and quality in colonoscopy. World J Gastroenterol. 2013 Apr 21;19(15):2355–61.

12. Paudel MS, Khanal A, Shrestha B, Purbey B, Paudel BN, Shrestha G, et al. Epidemiology of Inflammatory Bowel Diseases in Nepal. Cureus. 2021 Jul 28;13(7):e16692. doi: 10.7759/ cureus.16692. PMID: 34466323; PMCID: PMC8396412.

13. Sekiguchi M, Falkén Y, Matsuda T, Saito Y, Hultcrantz R. Colonoscopy quality and endoscopist factors: what are the required endoscopist conditions for high-quality colonoscopy to reduce colorectal cancer incidence and mortality? Mini-invasive Surgery. 2022; 6: 25. http://dx.doi.org/10.20517/2574-1225.2021.146

14. Kaminski MF, Thomas-Gibson S, Bugajski M, Bretthauer M, Rees CJ, Dekker E, et al. Performance measures for lower gastrointestinal endoscopy: a European Society of Gastrointestinal Endoscopy (ESGE) Quality Improvement Initiative. United European Gastroenterol J. 2017 Apr;5(3):309-334. doi: 10.1177/2050640617700014. Epub 2017 Mar 16. PMID: 28507745; PMCID: PMC5415221.

15. Rees CJ, Gibson ST, Rutter MD, Baragwanath P, Pullan R, Feeney M, et al. UK key performance indicators and quality assurance standards for colonoscopy. Gut. 2016 Dec;65(12):1923-1929. doi: 10.1136/gutjnl-2016-312044. Epub 2016 Aug 16. PMID: 27531829; PMCID: PMC5136732.