Comparison of caecal intubation rates between morning and afternoon colonoscopies at a tertiary hospital in Southwest Nigeria

*Akere A., Osundina M.A. and Tejan E.A.

Abstract

Background: Caecal intubation is an important measure of the quality of colonoscopy. Information on the effect of the time of colonoscopy on caecal intubation rate (CIR) is scarce. This study aimed to compare the CIR between morning and afternoon colonoscopies at the University College Hospital, Ibadan, Nigeria.

Methods: A descriptive study of consenting patients referred for colonoscopy at the endoscopy unit of the University College Hospital, Ibadan, from January 2016 to March 2017. Bowel preparation consisted of liquid diet and Epsom salt. Pre-medications were intravenous Midazolam 2.5-5 mg and Pentazocine 15-30 mg in titrated doses. Colonoscopy was performed using Olympus Exera III Videocolonoscope (CF HQ190L, Olympus UK). Morning procedures were those carried out between 8.30 am and 12.00 noon, while those after 12.00 noon were classified as afternoon procedures. Caecal intubation was considered successful when the medial wall of the caecum was visualized.

Results: Total of 177 colonoscopies were performed with 115 (65%) performed in the morning and 62 (35%) in the afternoon. In the morning, median age was 60 yrs, while in the afternoon, it was 61 yrs. Males (60.9% vs 58.1%) predominated in the morning, whereas females predominated in the afternoon (41.9% vs 39.1%), (p=0.72). In the morning, 100 (87%) patients had good/satisfactory bowel preparation, but 52 (83.9%) patients in the afternoon.(p=0.57). CIR was higher in the morning (90.4%), compared to afternoon (88.7%) (p=0.72).

Conclusion: There was no statistically significant difference between CIR in the morning and afternoon procedures.

Keywords: Caecal intubation rates, morning, afternoon, Southwest Nigeria

*Correspondence author
Akere A.
http://orcid.org/0000-0002-9596-3998
Email: adeakere@yahoo.co.uk

Department of Medicine, College of Medicine, University of Ibadan/University College Hospital, Ibadan, Nigeria

Comparaison des taux d'intubation caecale entre les coloscopies du matin et de l'après-midi dans un hôpital tertiaire du sud-ouest du Nigeria

*Akere A., Osundina M.A. and Tejan E.A.

Resume

Objectif: L'intubation caecale est une mesure importante de la qualité de la coloscopie. L'information sur l'effet du temps de la coloscopie sur le taux d'intubation caecale (CIR) est rare. Cette étude visait à comparer le CIR entre les coloscopies du matin et de l'après-midi à l'University College Hospital, Ibadan, au Nigeria.

Méthodes: Étude descriptive des patients consentants adressés pour coloscopie à l'unité d'endoscopie de l'University College Hospital, Ibadan, de janvier 2016 à mars 2017. La préparation intestinale consistait en un régime liquide et du sel d'Epsom. Les pré-médicaments étaient le midazolam 2,5-5 mg par voie intraveineuse et la pentazocine 15-30 mg en doses titrées. La coloscopie a été réalisée en utilisant un vidéocoloscope Olympus Exera III (CF HQ190L, Olympus UK). Les procédures du matin ont été effectuées entre 8 h 30 et 12 h, alors que celles qui ont eu lieu après midi ont été classées comme procédures de l'après-midi. L'intubation caecale était considérée comme réussie lorsque la paroi médiale du caecum était visualisée.

Résultats: Au total, 177 coloscopies ont été réalisées avec 115 (65%) effectuées le matin et 62 (35%) l'après-midi. Le matin, l'âge médian était de 60 ans, alors que l'après-midi, il était de 61 ans. Les mâles (60,9% vs 58,1%) prédominaient le matin, tandis que les femelles prédominaient l'après-midi (41,9% vs 39,1%) (p = 0,72). Le matin, 100 patients (87%) avaient une préparation intestinale satisfaisante / satisfaisante, mais 52 patients (83,9%) l'après-midi (p = 0,57). Le CIR était plus élevé le matin (90,4%) que l'après-midi (88,7%) (p = 0,72).

Conclusion: Il n'y avait pas de différence statistiquement significative entre CIR dans les procédures du matin et de l'après-midi.

Mots-clés: Taux d'intubation caecale, Matin, Après-midi, Sud-ouest du Nigeria

*Correspondance auteur:
Akere A.
http://orcid.org/0000-0002-9596-3998
Email: adeakere@yahoo.co.uk

Department of Medicine, College of Medicine, University of Ibadan/University College Hospital, Ibadan, Nigeria

INTRODUCTION

Caecal intubation is an important measure of the quality of examination during colonoscopy (1). It is generally accepted that caecal intubation rates (CIR) should be greater than 90% for both screening and diagnostic endoscopies (1-3). Among the factors that have been recognized that affect CIR are body mass index, age of the patients, quality of bowel preparation, gender of the patients, experience of the endoscopist, prior hysterectomy in female patients and history of constipation (4-14).

The impact of many of these factors on CIR had been studied, but information on the time of colonoscopy as it affects CIR is still relatively dearth. Some studies have reported lower CIR and higher failure rates with afternoon colonoscopies (15,16).

The aim of this study was to compare the CIR between morning and afternoon colonoscopies at the endoscopy unit of the University College Hospital, Ibadan, Nigeria.

MATERIALS AND METHODS

This was a descriptive study of consenting patients who were referred for colonoscopy at the endoscopy unit of the University College Hospital, Ibadan, from January 2016 to March 2017. Patients with prior hemicolectomy were excluded from the study. Bowel preparation for the procedure consisted of liquid diet, six sachets of Epsom salt mixed with two liters of water and taken orally a day prior to the procedure in two divided doses, and three sachets mixed with one liter of water taken early morning on the day of the procedure. All the patients had an overnight fast of about 10-12 hours, except for the Epsom salt taken on the morning of the procedure. Bowel preparation was adjudged as poor if there was a significant amount of semisolid/solid faeces; satisfactory, if only clear liquid or a small amount of semi-solid faeces; good, if only a small amount of clear liquid was seen in the colonic lumen. Those who had poor bowel preparation still had their procedures carried out but with much irrigation of the colon with water.

The conscious sedation consisted of intravenous midazolam 2.5-5 mg and pentazocine 15-30 mg in titrated doses. A digital rectal examination was carried out on all the patients prior to the insertion of the colonoscope. Written informed consent was obtained from each patient prior to the procedure. Colonoscopy was thereafter performed per protocol using Olympus Exera III video colonoscope (CF HQ190L, Olympus UK) with the patients in the left lateral position. However, change of position to supine was employed as necessary during the course of the procedure. All the procedures were performed by the same endoscopist. Morning procedures were those carried out between 8.30 am and 12.00 noon, while those carried out after 12.00 noon were classified as afternoon procedures. Caecal intubation was considered successful when the medial wall of the caecum was visualized. Patients' vital signs were monitored pre, intra and post procedure using multi-parameter monitor (Marathon Z, Health-care Equipment & Supplies Co. Ltd. UK). All procedures were carried out in accordance with the revised Helsinki Declaration of 2000.

After the procedure, all the patients were observed for two hours before being discharged home with an assistant. They were also counselled with respect to resumption of oral intake and to report any observed complication immediately.

The data were analyzed using SPSS version 17.0 (SPSS Inc., Chicago, IL, USA). Medians and interquartile ranges were used to express continuous variables. Univariate analysis of factors that affect caecal intubation was carried out. A p-value of < 0.05 was taken as statistically significant.

RESULTS

In this study, 177 colonoscopies were performed with 115 (65%) performed in the morning, while 62 (35%) were performed in the afternoon. Analysis of the age category showed that 18(10.2%) of the patients were less than 40 yrs of age, 92 (52%) were aged 40-64 yrs, while 67 (37.9%) were 65 yrs and older.

The median age of all the patients was 60 yrs (interquartile range 21 yrs). In the morning group, the median age was also 60 yrs (interquartile range 21 yrs), while in the afternoon group, it was 61 yrs (interquartile range 18 yrs). However, the median age difference was not statistically significant (p=0.48, u= 3335.0, z= -0.71, 95% CI= 4.34, 6.34).
There were 106 (59.9%) males and 71 (40.1%) females. There were more males (60.9% vs 58.1%) in the morning group, whereas females predominated in the afternoon group (41.9% vs 39.1%), but this was not statistically significant (p=0.72, 95% CI= 195.8, 235.4)

Overall, the bowel preparation was adjudged as good/satisfactory in 152 (85.9%) patients, while 25 (14.1%) patients had poor bowel preparation. Further analysis of the quality

of bowel preparation showed that 100 (87%) of the morning group had good/satisfactory bowel preparation, while this was observed in 52 (83.9%) patients in the afternoon group. This difference was also not significant (p=0.57, 95% CI= 17.78, 23.98)

The most frequent indications in both morning and afternoon procedures were haematochezia, constipation, and abdominal pain. Table 2. In the morning group, the most frequent colonoscopic diagnoses were hemorrhoids, colonic polyps, and colonic diverticulosis; while in the afternoon group, the most frequent diagnoses were colonic polyps, normal study, and colonic diverticulosis. Table 3.

The crude CIR in the two groups was 89.8% (159/177). However, the results showed that CIR was higher in the morning group (90.4%), compared to the afternoon group (88.7%). But, the difference was not statistically significant (p=0.72, 95% CI= 16.81, 20.21)

DISCUSSION

This study found a lower caecal intubation rate in the afternoon compared to morning colonoscopies, which was not significant. This is in contrast to the findings of Sanaka et al. (15) and Wells et al. (16), in which significantly lower CIR was found in the afternoon compared to morning procedures. However, these studies were retrospective and the sample sizes were larger compared to this present study.

In another study by Singh et al. (17) polyp (PDR) and adenoma detection rates (ADR) were found to be lower in the afternoon compared to morning colonoscopies. Although our study did not compare PDR and ADR between morning and afternoon colonoscopies, which is one of the limitations of this study, ADR has been described as an important benchmark for quality colonoscopy and the timing of colonoscopy has been found to independently predict outcome (18).

Endoscopist and staff fatigue as the day progresses could have explained the lower CIR observed in our study (16), although this was difficult to measure. But, the fact that the same endoscopist, nursing and support staff performed both the morning and afternoon colonoscopies could make this a potential factor to consider.

Another reason could have been the difference in the quality of bowel preparation between the morning and afternoon groups. It is known that a quality colonoscopy depends on adequate bowel preparation and that poor bowel preparation may render caecal intubation difficult.(3) In this study, bowel preparation was observed to be better in the morning group compared to the afternoon group, but this was not significant. In contrast, Sanaka et al. (15) Wells et al. (16) and Singh et al. (17) found a significantly better bowel preparation quality in the morning compared to afternoon colonoscopies.

Several studies have observed the time interval between the start of bowel preparation and the timing of colonoscopy to affect the adequacy of bowel preparation (19-22). Kim et al. (23) found that colonoscopies performed within 3-6 hours after the last intake of the bowel cleansing agent had better quality bowel preparation. In our study, the last dose of bowel cleansing agent was taken between 5-6 am on the morning of the procedure.

In our study, there were more females in the afternoon group compared to the morning group. This could also account for the lower CIR recorded in the afternoon colonoscopies. Studies have found that caecal intubation is lower in females than in males because colonoscopy has been described as more challenging in females than in males (6,7,24,25). This is due to some anatomic variations observed in females, which include more angulations and tortuosity present in female colons, longer female colons, dipping of the transverse colon into the pelvis and deeper pelvis in females (26-28).

The small sample size in our study, which is another limitation could have made some important variables not to be statistically significant. Therefore, a similar study with a larger sample size is recommended.

CONCLUSION

In our practice, there was no statistically significant difference between CIR in the morning and afternoon procedures.

Conflict of interest: All the authors have declared no conflict of interests

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Table 1: Univariate analysis of morning versus afternoon parameters

Parameter	Morning	Afternoon	p-value
Median age (yrs)	60 yrs	61 yrs	0.48
Interquartile age (yrs)	21 yrs	18 yrs	t = - 0.52
Male (n, %)	70 (60.9)	36 (58.1)	0.84
Female (n, %)	45 (39.1)	26 (41.9)	0.72
Bowel preparation			
Good/Satisfactory	100 (87)	52 (83.9)	0.57
Poor	15 (13)	10 (16.1)	
CIR	104 (90.4)	55 (88.7)	0.72

Table 2: Indications for colonoscopy

Indication	Morning Colonoscopy (115) n (%)	Afternoon Colonoscopy (62) n(%)
Haematochezia	51(44.3)	20(32.3)
Constipation	19(16.5)	12(19.4)
Abdominal pain	17(14.8)	9(14.5)
Suspected colonic tumour	6(5.2)	7(11.3)
Positive FOBT	5(4.4)	1(1.6)
Chronic diarrhoea	4(3.5)	4(6.5)
Screening	3(2.6)	-
Anal protrusion	2(1.7)	2(3.2)
Raised CEA	2(1.7)	-
Surveillance	2(1.7)	1(1.6)
Recurrent mucoid stool	1(0.9)	1(1.6)
Faecal incontinence	1(0.9)	-
Altered bowel habit	1(0.9)	1(1.6)
Anaemia of unknown cause	1(0.9)	2(3.2)
Anal pain	-	1(1.6)
Thickened rectum on CT	-	1(1.6)

FOBT- Faecal occult blood test

Table 3: Colonoscopic Diagnoses

Diagnosis	Morning colonoscopy n(%)	Afternoon colonoscopy n(%)
Haemorrhoids	33(28.7)	10(16.1)
Colonic polyps	32(27.8)	16(25.8)
Colonic diverticulosis	30(26.1)	12(19.4)
Normal	24(20.9)	16(25.8)
Colorectal tumour	12(10.4)	10(16.1)
Colitis	5(4.3)	4(6.5)
IBD	3(2.6)	2(3.2)

IBD- Inflammatory bowel disease