Introduction
Constipation is a common referral diagnosis to surgical and colorectal units and its prevalence and relationship to colorectal cancer (CRC) has not been studied in South Africa. The association of constipation and colorectal cancer is highly variable. Some reports have found an increased incidence while others have not. The aim of this study is to investigate the incidence of colorectal cancer (CRC) and other significant colorectal pathologies in patients undergoing colonoscopy for constipation.

Methods
All colonoscopy reports for constipation were retrieved from our database from January 2011 to 30 June 2014. Data extracted included demographics, colonoscopic findings and adequacy of bowel preparation. Exclusion criteria included patients with other symptoms known to be associated with colonic neoplasia such as lower GIT bleeding, loss of weight, patients with associated anaemia, those with abnormalities on imaging, patients with personal or family history of colorectal cancers or colorectal polyps and patients with inflammatory bowel disease. The primary outcome was the presence of neoplasia at colonoscopy and the secondary outcomes were other colonoscopy findings.

Results: A total of 985 colonoscopies were performed from January 2011 to June 2014 of which 144 were done for a referral diagnosis of constipation. Eighty eight (61.1%) were female. Their mean age was 58.6 ± 13.8 years (range 19–95 years). There were 61 (42.4%) African patients, 38 (26.4%) White, 33 (22.9%) Asians and 12 (8.3%) Coloured patients. Eighty seven (60.4%) patients had a normal colonoscopy, 20 (13.9%) diverticular disease, 14 (9.7%) polyps of which 6 (4.2%) were neoplastic, and 9 (6.3%) had colorectal cancer.

Conclusions: Constipation is associated with CRC. The presence of constipation should be a criterion for colonoscopy regardless of age or any other associated clinical features.

Keywords: Constipation, Colonoscopy, colorectal cancer, adenoma, colorectal polyp.

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known to be associated with colonic neoplasia such as lower GIT bleeding, loss of weight, patients with associated anaemia, those with abnormalities on imaging, patients with personal or family history of colorectal cancers or colorectal polyps and patients with inflammatory bowel disease.

Data extracted included demographics, adequacy of bowel preparation, and colonoscopic findings. The patient’s race was classified as African, White, Asian and Coloured (mixed race) according to the South African Population Registration Act.10 The race of the patient was determined by the health professional during the consultation. This was both by self-declaration and assessment by the health professional. The terminology used is that described in the South African Population Registry, i.e. White, Indian, Coloured and Black, rather than Caucasian, African, Asian and Mixed. The primary outcome was the presence of neoplasia at colonoscopy. Secondary outcomes were other colonoscopic findings including a normal colonoscopy.

Results

There were 985 patients from January 2011 to June 2014 who underwent colonoscopy. Of these 144, of mean age 58.6 ± 13.8 years, were referred for a diagnosis of constipation and they form the basis of this study. Eighty eight (61.1%) were female (M:F ratio 1:1.6). There were 61 (42.4%) African, 38 (26.4%) White, 33 (22.9%) Asian and 12 (8.3%) Coloured patients. The median ages (range) were 57 (19–86 years) for Africans, 63 (37–81) for Whites, 56 (27–90) for Indians and 60 (21–95) for Coloureds. Thirty nine (27.1%) were below the age of 50 years and 105 (72.9%) older than 50 years.

Eighty seven patients had a normal colonoscopy. The colonoscopic findings are shown in Table 1 and Table 2. The quality of colonoscopy preparation was ranked excellent in the majority of cases. The most common findings at colonoscopy were diverticular disease (20 polyps (14) and colorectal cancer (9). Adenomatous polyps were seen only in patients > 50 years of age. CRC was found in both patients of age < 50 years and > 50 years and was seen in all population groups. The most commonly observed non-neoplastic condition was diverticular disease, seen in only older patients.

Discussion

Colonoscopy has been shown to be the method of choice to screen and detect early colorectal cancer (CRC).9 Although alteration in bowel habits is one of the important manifestations of this disease, the association of constipation and colorectal cancer remains controversial. Even though the evidence is scanty, constipation has been shown to be uncommon in Africa. A Nigerian study showed the prevalence of constipation to be low.11 In rural Nigeria it was 0.8%, while in urban Nigeria it was 2.8%.11 The worldwide prevalence of constipation is estimated to be 14% in first world countries.12 High risk groups include the elderly with incidence ranging from 40% to 74%.13,14 Many studies show that constipation is poorly predictive of colorectal cancer.9,15,16 Even in low prevalence regions such as ours, constipation has been shown to be a poor predictor of colorectal cancer.16

The proportion of patients with adenomatous polyps
was 4.2%. This is lower than the 5.5–19.6% reported in the literature. However, when patients > 50 years of age are considered, the figure of 5.7% approaches that reported in the literature. Angelo and Dreyer observed in 2001 that adenomatous polyps among Africans, previously considered rare, were seen more frequently than a decade earlier and were occurring in proportions similar to that seen in their White counterparts. The incidence of adenomatous polyps between African and White patients is similar in this study with 4.9% and 5.3% respectively. In the White population, adenomatous polyps occur exclusively in the older than 50-years age group, whereas in the African population they occur in both the younger and older age groups. The increase in the prevalence of adenomatous polyps seen among Africans as reported by Angelo and confirmed in our study suggest that colonoscopy for constipation may be as relevant in Africans as it is in the White population group.

The CRC prevalence of 6.3% in this series was much higher than the 0–1.7% reported in the literature. African studies have shown a low but increasing incidence of CRC in African patients in South Africa and Africa. This increase is expected to continue in the future. This can be presumed by the fact that Africans residing in high incidence areas such as America have a much higher incidence than Africans in Africa. In fact, the incidence of CRC in African Americans is higher than that of White Americans.

Africa and South-Central Asia have the lowest incidence of colorectal cancer in the world and the highest rates are seen in Australia and New Zealand where they may be up to 45.7/100 000 population. Though the incidence of CRC is not well studied in Africa, it is estimated to be 4.04 per 100 000 population in Sub-Saharan Africa. South Africa, which presumably has the most reliable cancer registries in Sub-Saharan Africa, has an even lower incidence of 3.7 per 100 000.

In such low incidence areas, the selection of symptomatic patients, such as those with constipation, could be used to increase the diagnostic yield for CRC. Furthermore, the prevalence of CRC detected at colonoscopy in patients referred for constipation was similar in both patients younger than 50 years and those older than 50 years at 5.1% and 6.7% respectively. Intuitively one would expect a higher incidence in the older age group. This paradox is, however, not surprising since local evidence and other African studies suggest a higher proportion of young patients with CRC.

Young African patients seem to have a higher risk of CRC even when compared to African Americans. There are concerns regarding the accuracy of CRC data emanating from registries in South Africa and the rest of Africa with some authorities suggesting that the low incidence may be exaggerated by under-reporting and missed diagnosis, under-diagnosis due to poor access to health care centres or may be influenced by the low life expectancy reported in Africa. Although these concerns we think that the low incidence of colorectal cancer is accurate as these findings have been shown consistently over the past two to three decades. Though the incidence remains low, an increasing prevalence has been noted locally and in other African countries during this same period. Some authors have attributed this increase to one or a combination of factors, including change in dietary habits (to western diet), increased awareness of colorectal cancer, increased life expectancy, increased accessibility of health services, and improved socioeconomic status. This increasing prevalence needs to be verified by more studies.

An interesting subject in the literature of CRC is the comparison between African patients and other races, especially Whites. In this study, the number of patients is too low to make such comparisons. In South Africa, there

### Table 2: Colonoscopy findings according to race and age

<table>
<thead>
<tr>
<th>Condition</th>
<th>Black n(%)</th>
<th>White n(%)</th>
<th>Indian n(%)</th>
<th>Coloured n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer</td>
<td>Total</td>
<td>&lt;50yrs</td>
<td>&gt;50yrs</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>n=61</td>
<td>n=19</td>
<td>n=42</td>
<td>n=38</td>
</tr>
<tr>
<td>Cancer</td>
<td>5 (8.2)</td>
<td>1 (5.3)</td>
<td>4 (9.5)</td>
<td>1 (2.6)</td>
</tr>
<tr>
<td>Polyps</td>
<td>5 (8.2)</td>
<td>3 (15.8)</td>
<td>2 (4.8)</td>
<td>5 (13.2)</td>
</tr>
<tr>
<td>Adenomatous</td>
<td>3 (4.9)</td>
<td>1 (5.3)</td>
<td>2 (4.8)</td>
<td>2 (5.3)</td>
</tr>
<tr>
<td>None Neoplastic</td>
<td>2 (3.3)</td>
<td>2 (10.5)</td>
<td>0</td>
<td>3 (7.9)</td>
</tr>
<tr>
<td>Diverticular Disease</td>
<td>3 (5)</td>
<td>0</td>
<td>3 (7.1)</td>
<td>14 (36.8)</td>
</tr>
<tr>
<td>Haemorrhoids</td>
<td>1 (1.6)</td>
<td>1 (5.3)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Colitis</td>
<td>4 (6.6)</td>
<td>1 (5.3)</td>
<td>3 (7.1)</td>
<td>2 (5.3)</td>
</tr>
<tr>
<td>Normal</td>
<td>40 (65.6)</td>
<td>13 (68.4)</td>
<td>30 (71.4)</td>
<td>15 (39.5)</td>
</tr>
<tr>
<td>Age (years): Median</td>
<td>56.7</td>
<td>63.2</td>
<td>37.8</td>
<td>27-90</td>
</tr>
</tbody>
</table>
Table 2: Colonoscopy findings according to race and age

<table>
<thead>
<tr>
<th></th>
<th>Black n(%)</th>
<th>White n(%)</th>
<th>Indian n(%)</th>
<th>Coloured n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;50 yrs</td>
<td>2 (10.5)</td>
<td>2 (4.8)</td>
<td>2 (4.8)</td>
<td>5 (13.2)</td>
</tr>
<tr>
<td>51-60 yrs</td>
<td>3 (7.9)</td>
<td>2 (4.8)</td>
<td>1 (2.6)</td>
<td>1 (3.1)</td>
</tr>
<tr>
<td>61-70 yrs</td>
<td>3 (9.3)</td>
<td>2 (4.8)</td>
<td>1 (3.0)</td>
<td>0</td>
</tr>
<tr>
<td>71-80 yrs</td>
<td>1 (2.6)</td>
<td>1 (2.6)</td>
<td>1 (2.6)</td>
<td>1 (2.6)</td>
</tr>
<tr>
<td>&gt;80 yrs</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>8 (4.8)</td>
<td>6 (3.6)</td>
<td>4 (2.5)</td>
<td>8 (2.5)</td>
</tr>
</tbody>
</table>

Range Age (years): Median

- Haemorrhoids: 1 (1.6)
- Diverticular Disease: 3 (5)
- Adenomatous Polyps: 5 (8.2)
- Cancer: 5 (8.2)

There are several limitations to our study. It is a retrospective study and the sample size is small. Criteria for constipation were not clearly defined. Quality markers for colonoscopy, such as caecal intubation rate and duration of withdrawal, were not documented. A detailed enquiry regarding the risk of CRC was not taken. A possibility exists that a higher proportion of lesions may be missed by a fellow who is in training. However, fellows in our institution are experienced as they have been qualified as general surgeons for some time before entering the colorectal fellowship program. Any further planned studies on this topic should consider these factors.

In conclusion, the prevalence of CRC in patients with constipation is significant. Until further prospective trials are available in our patient population, constipation should be treated as an indication for colonoscopy regardless of age or any other clinical features.

Conflict of Interest

None

REFERENCES

9. Park JY, Mitrou PN, Luben R, Khaw KT, Bingham SA. Is bowel habit linked to colorectal cancer? Results from the EPIC-


12. Suares NC, Ford AC. Prevalence of, and risk factors for, chronic idiopathic constipation in the community: systematic review and meta-analysis. Am J Gastroenterol. 2011;106(9):1582-91; quiz I, 92.


