Flexible Sigmoidoscopy in Symptomatic Patients - There are Significant Benefits to Using a Paediatric Colonoscope in Female Patients

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Background
Flexible sigmoidoscopy is used to investigate active colorectal symptoms as well as for colorectal cancer screening. Previous studies in asymptomatic subjects undergoing screening flexible sigmoidoscopy have shown that a) women tend to experience more pain during the procedure and b) the median insertion depth is significantly less in men [1,2]. In many hospitals, flexible sigmoidoscopy/limited left-sided colonoscopy is conducted using a full-length adult colonoscope rather than a 60cm flexible sigmoidoscope [3,4]. We were particularly interested to see if the previously observed differences between male and female patients noted at non-sedated flexible sigmoidoscopy [1,2] would also be seen in symptomatic subjects and if so whether using a paediatric colonoscope conferred any advantage.

Aims
To 1) quantify the difference in shaft stiffness between a paediatric and typical adult colonoscope and 2) establish if there was any advantage to using a ‘flatter’ 130cm length paediatric endoscope rather than a stiffer 165cm adult colonoscopy in symptomatic patients attending a ‘Fast Track’ surgical flexible sigmoidoscopy list.

Methods
Flexural rigidity measurement
We used a modified beam deflection method [5] to measure the flexural rigidity of the colonoscopes used in the clinical trial. The endoscopes were either an 11.2mm diameter Olympus PCF-240I 130cm long paediatric colonoscope (P-C) or alternatively a stiffer adult colonoscope (A-C) in the form of an Olympus CF-230L or CF-240L colonoscope.

Power calculation
Based on our previous experience [2] we estimated that we would be able to perform a non-sedated flexed sigmoidoscopy at least to the sigmoid/descending colon junction in 75% of patients in the A-C group and 95% in the P-C group. The power calculation suggested that, in order to have a 95% chance of detecting a significant difference (P<0.05) between the two groups, we would need to have 58 patients in each arm of the study. To allow for exclusions because of tinctur abutting tumours or poor bowel preparation we elected to enter 105 patients into each arm of the study. To allow for (P<0.05) between the A-C and P-C group, we would need to have a 90% chance of detecting a significant difference (P=0.0059) b) beyond the splenic flexure (P=0.0041) and c) to the caecal pole (P=0.0349).

Clinical trial
Of the 210 patients entered into the study, there were 11 exclusions including 5 patients with obstructing tumours and 5 with inadequate bowel preparation. The two groups of patients were reasonably well matched in terms of age, gender ratio and, in the case of the female patients, a past history of hysterectomy – see Table 1. The median (range) time to pass the endoscope to point of maximum insertion was very similar in the P-C and A-C groups at 6.2 (3.0-15.3) min and 6.3 (2.6-12.6) min respectively.

Results (figures 1, 2 & tables 1-3)
Flexural rigidity measurement
This confirmed that the shaft of the Olympus 11.2mm diameter PCF-240I colonoscope (P-C) was significantly less stiff (P<0.001) than either that of the 12.2mm diameter CF-240L or 12.5mm diameter CF-250L adult colonoscopes (A-C) at all points from 20-125cm from the distal bending tip – see Figure 1.

Clinical trial
The P-C tended to cause less pain in both men (P<0.002) and women (P=0.2447) than the A-C. In a) all females and b) those with a hysterectomy the P-C permitted a greater median insertion depth (P=0.002 and P=0.001, respectively) than the A-C – see Figure 1. Females in the A-C group who had had a previous hysterectomy had significantly more total episodes of pain/discomfort than those in the A-C group who had not undergone previous pelvic surgery.

Table 2: Differences between the P-C and A-C groups

<table>
<thead>
<tr>
<th>Parameter</th>
<th>P-C</th>
<th>A-C</th>
<th>P (two-tailed)</th>
</tr>
</thead>
<tbody>
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<td>Insertion depth (cm)</td>
<td>5.99</td>
<td>4.19</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Time to pass colposcope (min)</td>
<td>4.88</td>
<td>3.35</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Number of episodes of discomfort or pain (median and range)</td>
<td>0 (0-18)</td>
<td>1 (0-11)</td>
<td>0.0244</td>
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Conclusion
This study showed that at flexible sigmoidoscopy in symptomatic patients, women experience significantly more pain and have a lower median insertion depth than men. This confirms what we had previously shown at screening flexible sigmoidoscopy in asymptomatic subjects [1,2]. We believe that the method of assessing pain/discomfort used in the present study [9] is superior to the usual global visual analogue scale used in previous publications.

Over a quarter of our women in our study had had a previous hysterectomy. With an adult colonoscope, these women had more pain and a lower insertion depth than female patients who have not had pelvic surgery. We have shown that it is possible to reduce the total amount of discomfort associated with non-sedated flexible sigmoidoscopy as well as achieve a greater insertion depth by using a flatter paediatric colonoscope.

Table 3: Differences between the P-C and A-C groups

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Acknowledgements
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References