Diagnostic work-up of rectal bleeding in general practice

Christoph Heintze, Dorothea Matysiak-Klose, Thorsten Kröhn, Ute Wolf, Alexander Brand, Christoph Meisner, Imma Fischer, Hartwig Wehrmeyer and Vittoria Braun

ABSTRACT

Background
GPs have many patients with gastrointestinal discomfort. Among bowel-related complaints, the sign of rectal bleeding is of particular importance in patients aged 50 years and above, as it can be an early sign for serious bowel diseases such as colon carcinoma. Despite many guidelines offered to GPs for screening and early detection of colorectal carcinomas, there is very little information about the actual diagnostic approach to the sign of rectal bleeding.

Aim
The aim of the study was to collect data concerning treatment strategies used by GPs who treat patients presenting with rectal bleeding.

Design of study
Prospective data collection.

Setting
General practices in Germany.

Method
Over the course of a year, GPs recorded their treatment strategies in patients presenting with rectal bleeding and associated symptoms. Using a digital practice patient file, physicians participating in the study were able to continuously transmit data electronically to the researchers of the study about diagnostics, referrals, hospital admissions, and final diagnoses.

Results
During the course of 1 year, 94 participating physicians collected data on 1584 patients. Information about treating rectal bleeding was recorded for 422 patients; 60% of the patients were referred to specialists in internal medicine or gastroenterologists for further diagnostics. A colonoscopy was the most frequently performed diagnostic procedure (46.2%). Twenty-two per cent (n = 93) of the patients — 54 of them aged 50 years and above — were exclusively treated by their GP without conducting a colonoscopy or cooperating with specialists. For these patients, GPs diagnosed less severe diseases like haemorrhoids or other proctologic diseases.

Conclusion
By using a study that allows GPs to transmit electronically their findings and data, it is possible to draw a picture of treatment strategies of GPs in patients presenting with rectal bleeding. The high percentage of patients who received medical treatment in consultation with specialists underscores the significance of the sign of rectal bleeding in general practice. The need for further diagnostic measures in patients who have been treated exclusively by GPs has to be discussed.

Keywords
bleeding; colonoscopy; colorectal cancer; general practice; internet; rectal diseases; survey.

INTRODUCTION
Change in bowel habits, frequent abdominal pain, and rectal bleeding are common reasons for consulting a GP.1 The symptom of rectal bleeding in particular requires exact diagnosis because it can be an early sign of severe bowel diseases, such as colon carcinoma, or inflammatory bowel diseases. An examination of 99 patients aged over 40 years and presenting with a first episode of rectal bleeding who had been referred for a colonoscopy by GPs, showed serious abnormal findings in 44.9% of the cases.2 An estimated incidence of 8.3 and 7 in 1000 persons per year3,4 underscores the importance of this symptom in general practice.

Exact diagnostics are of crucial prognostic importance for an early detection of a colorectal carcinoma. Screening programmes and prompt treatment of colorectal carcinoma increases the survival time,5–7 although some doubts remain.8 Although there are many gastroenterological guidelines9–11 and studies12,13 about detecting colorectal carcinomas, little is known about treatment strategies in general practice. A survey among Australian GPs about treating the symptom

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of rectal bleeding using case samples revealed a
great variety of suggested diagnostic approaches.
There was uncertainty about using existing
guidelines. Olynyk et al remarked that in general
practice there is a tendency to over- or undertreat
patients with rectal bleeding.

The aim of the present study is to record the
performance of GPs of patients with rectal
bleeding. The applied diagnostic measures,
cooperation between GPs and specialists, and the
final diagnoses are of special interest.

METHOD
A nationwide research network was established to
connect clinical research with the current activities
of GPs concerning chronic bowel diseases
(Kompetenznetz Chronisch Entzündliche
Darmerkrankung). The Institute of General Medicine
(Institut für Allgemeinmedizin) in Berlin solicited
2400 GPs in Germany to participate in the study; of
these, 116 agreed to participate.

In a prospective study, GPs entered information
about patients with chronic bowel diseases into a
digital computer template to transmit it via internet
or ISDN to the researchers of the study.

The study’s five criteria were rectal bleeding,
abdominal pain over 21 days, changed bowel
habits over 21 days, evidence of bowel-related
anaemia, or loss of weight. Patients with known
chronic inflammatory bowel disease, a known
colon carcinoma, or diagnosed polyps were also
included in the study. The participating physicians
recorded information about age, sex, occupation,
the initial complaints, the ensuing diagnostic
measures, and the final diagnoses. Three months
before the start of the study the specially designed
template was subjected to a feasibility phase to
meet the requirements of the participating
physicians.

Each participating physician randomly received
only three of the five criteria in order to reduce the
workload. Patients presenting with at least one
bowel symptom and who were aged 15 years or
more were included in this study. To draw the picture
of managed care as clearly as possible, patients had
to meet minimum criteria regarding patient
documentation recorded by the participating physicians:

- entry of at least 7 out of 10 personal data fields,
- at least one valid detail in the fields of
diagnostics, procedure, diagnosis, or therapy,
- ability to confirm patient data during monitoring
of the study physicians.

During the course of the study, monitoring was
performed to evaluate the quality of the entered
patient data by comparing the practice patient files
regarding personal data, family history, diagnostics,
procedures, and final diagnoses with the data
provided for the study. Thirty-five of 116 physicians
were randomly selected for visits to validate the
quality of the data record.

Every patient signed a written consent form
before the beginning of the study. The data
collection took place in accordance with the data
protection official.

Data management
Data input was performed via an internet-based
computer template (‘remote data entry’).

The application server was securely accessed by
entering a password to a common internet
browser. GPs established a connection to the
browser through the computers in their respective
individual practices. Data were stored centrally on
a SQL server in a relational data model.

Statistical analysis
From the total group of recorded patients
presenting with bowel diseases and symptoms, the
present analysis only incorporates findings of
patients presenting with the first sign of rectal
bleeding and associated symptoms, but without
pre-existing bowel diseases. The descriptive
analysis was performed by the Institute of Medical
Information Processing, using the statistics
programmes SAS 8.0 and SPSS 11.0. The analysis
for free text data was performed in patients where
neither a consultation with another specialist nor a
colonoscopy was recorded.

RESULTS
Study sample
Over the course of 1 year, 2239 patients with
chronic bowel symptoms and diseases were
registered by 116 GPs. Ten participating physicians
resigned before the end of the study for personal
reasons; 12 physicians discontinued due to lack of cooperation. The majority of the participating physicians were between 40 and 50 years old. Two-thirds of them were male and a third were female. The median number of years spent working in general practice was nine. Age, sex, and time in private practice of the physicians who left the study early conformed with those who remained in the study.

All in all, 1969 patients were registered by 94 participating physicians over the course of 1 year. There were 1584 patients who met the minimum requirements and were included in the analysis.

**Monitoring of the participating physicians**

In order to ensure validity of reported information, 35 GPs' practices were visited and the original patient files studied. The comparison between the data documented in the patient files by the GPs and the data they actually entered into the digital template revealed a concordance of 70%.

**Table 1. Main symptoms and work-up of rectal bleeding in general practice.**

<table>
<thead>
<tr>
<th>Symptom of rectal bleeding</th>
<th>&lt;50 years (total = 153)</th>
<th>≥50 years (total = 268)</th>
<th>Total (total = 422)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>73 (47.4%)</td>
<td>126 (47.2%)</td>
<td>199 (47.3%)</td>
</tr>
<tr>
<td>Male</td>
<td>80 (51.9%)</td>
<td>141 (52.8%)</td>
<td>222* (52.7%)</td>
</tr>
<tr>
<td>Accompanying symptoms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abdominal pain &gt;3 weeks</td>
<td>33 (21.4%)</td>
<td>64 (24.0%)</td>
<td>97 (23.0%)</td>
</tr>
<tr>
<td>Change in bowel habits &gt;3 weeks</td>
<td>25 (16.2%)</td>
<td>47 (17.6%)</td>
<td>73* (17.3%)</td>
</tr>
<tr>
<td>Anaemia</td>
<td>7 (4.5%)</td>
<td>16 (6.0%)</td>
<td>23 (5.5%)</td>
</tr>
<tr>
<td>Weight loss</td>
<td>3 (1.9%)</td>
<td>10 (3.7%)</td>
<td>13 (3.1%)</td>
</tr>
<tr>
<td>Referrals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialist in internal medicine or gastroenterologist</td>
<td>84 (54.5%)</td>
<td>170 (63.7%)</td>
<td>254 (60.3%)</td>
</tr>
<tr>
<td>Surgeon</td>
<td>9 (5.8%)</td>
<td>10 (3.7%)</td>
<td>19 (4.5%)</td>
</tr>
<tr>
<td>Radiologist</td>
<td>3 (1.9%)</td>
<td>9 (3.4%)</td>
<td>12 (2.9%)</td>
</tr>
<tr>
<td>Other specialists</td>
<td>12 (7.8%)</td>
<td>16 (6.0%)</td>
<td>28 (6.7%)</td>
</tr>
<tr>
<td>Admissions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialist in internal medicine or gastroenterologist</td>
<td>8 (5.2%)</td>
<td>19 (7.1%)</td>
<td>27 (6.4%)</td>
</tr>
<tr>
<td>Surgery</td>
<td>3 (1.9%)</td>
<td>15 (5.6%)</td>
<td>18 (4.3%)</td>
</tr>
<tr>
<td>Other specialists</td>
<td>2 (1.3%)</td>
<td>3 (1.1%)</td>
<td>5 (1.2%)</td>
</tr>
<tr>
<td>Conducted diagnostics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemoglobin</td>
<td>72 (46.8%)</td>
<td>135 (50.6%)</td>
<td>207 (49.2%)</td>
</tr>
<tr>
<td>Sonography</td>
<td>13 (8.4%)</td>
<td>41 (15.4%)</td>
<td>54 (12.8%)</td>
</tr>
<tr>
<td>Colonoscopy with terminal ileum</td>
<td>34 (22.1%)</td>
<td>88 (33.0%)</td>
<td>122 (29.0%)</td>
</tr>
<tr>
<td>Colonoscopy without terminal ileum</td>
<td>22 (14.3%)</td>
<td>51 (19.1%)</td>
<td>73 (17.3%)</td>
</tr>
<tr>
<td>Rectoscopy</td>
<td>10 (6.5%)</td>
<td>18 (6.7%)</td>
<td>28* (6.9%)</td>
</tr>
<tr>
<td>Sigmoidoscopy</td>
<td>12 (7.8%)</td>
<td>14 (5.2%)</td>
<td>26 (6.2%)</td>
</tr>
<tr>
<td>Gastroscopy</td>
<td>12 (7.8%)</td>
<td>25 (9.4%)</td>
<td>37 (8.8%)</td>
</tr>
<tr>
<td>Small bowel and colon contrast</td>
<td>1 (0.6%)</td>
<td>3 (1.1%)</td>
<td>4 (1.0%)</td>
</tr>
<tr>
<td>Abdominal CT scan/MRI/X-ray</td>
<td>1 (0.6%)</td>
<td>10 (3.7%)</td>
<td>11 (2.6%)</td>
</tr>
</tbody>
</table>

*One patient of unknown age. *One patient of unknown sex.

**Rectal bleeding in general practice**

This study presents the results of the 422 patients in whom the GPs recorded the sign of rectal bleeding. The most common accompanying symptoms associated with rectal bleeding (Table 1) were abdominal pain (23.0%), changed bowel habits (17.3%), anaemia (5.5%) and weight loss (3.1%).

**Diagnostic work-up of rectal bleeding**

In response to the sign of rectal bleeding, an abdominal sonography was performed in 54 (12.8%) patients. In 10 patients the examination was conducted by a GP alone, in 15 patients the sonography was performed by both a GP and a specialist. Twenty-eight patients were referred to a specialist — of these, 25 had a sonography done by a gastroenterologist or specialist in internal medicine.

Of the 29 rectoscopies conducted, seven were performed by GPs, 14 by gastroenterologists or specialists in internal medicine, and four by other specialists. In four patients the rectoscopy was conducted by both a GP and a gastroenterologist or a specialist in internal medicine. Of all 26 sigmoidoscopies, seven were performed by a GP, 23 by a gastroenterologist or a specialist in internal medicine and four by other specialists. In eight patients the sigmoidoscopy was conducted by both a GP and gastroenterologists or specialists in internal medicine.

The participating physicians referred 280 patients (66.4%) to specialists (gastroenterologists, radiologists, physicians with special interests); the GPs made more than one referral to specialists for some patients. They conducted 50 admissions directly to hospital for 46 patients (10.9%) during the course of the study.

The most frequently performed diagnostic procedure was a colonoscopy. Of the 195 colonoscopies performed, in 37.4% of the cases the terminal ileum was left unexamined. As predicted, in 268 patients aged 50 years and above, colonoscopies were performed more often (51.9%; n = 139) than in the 153 younger patients (36.6%; n = 56; P<0.003). Rectoscopies (6.9%, n = 29) and sigmoidoscopies (6.2%, n = 26) were rarely performed in the total group of patients (n = 422).

**Diagnoses following presentation with symptoms of rectal bleeding**

Of all patients presenting with the sign of rectal bleeding, haemorrhoids was the most common newly diagnosed bowel disease (26.1%, n = 110; Table 2), followed by polyps of different grades of differentiation (10.7%, n = 45), diverticulosis/
diverticulitis (9.5%, \(n = 40\)) and patients with disorders of the upper gastrointestinal tract (8.7%, \(n = 37\)). Colon carcinoma was diagnosed in 17 cases (4.0%), inflammatory bowel disease (including Crohn’s disease, ulcerative colitis, and undetermined colitis) was detected in 22 patients (5.2%).

For 93 of the patients (22.0%), there was no documentation from their GPs about cooperation with other specialists, nor were further diagnostic measures taken. The analysis of the physicians’ explanatory notes for these patients showed that presumable pre-existing bowel diseases, such as diverticulosis, were found in nine of the patients. Additionally, it revealed upper gastrointestinal tract diseases in four patients. The GPs recorded haemorrhoids or other proctologic diseases, such as anal fissures, in 58 patients. Twenty-five of these patients were aged 50 years and above. The course of disease and the diagnostics could not be assessed with the data provided in the explanatory notes in 22 of the 93 patients.

### Patients without further diagnostic procedures

Ninety-three patients (54 of them aged 50 years and above) were treated exclusively by their GPs— with no further diagnostic procedure or consultations with specialists.

The additional analysis of the explanatory notes revealed that 27 patients aged 50 years and above were found to have exclusively haemorrhoids or other proctologic diseases as their final diagnosis. For this group of patients, bright red bleeding was the most common first symptom \((n = 19)\), associated with further bowel-related symptoms in seven patients (Table 3). Further analyses of findings revealed that blood mixed with stools \((n = 2)\) and blood on stools \((n = 2)\) occurred more rarely. However, in four patients with haemorrhoids diagnosed by the physicians, the faecal occult blood test (FOBT) screening was positive. One of the patients refused further diagnostic procedures.

### DISCUSSION

#### Summary of main findings

This study investigates strategies of the diagnostic work-up of patients presenting with rectal bleeding in general practice. An electronic link between surgeries and the coordinating university enabled physicians to record their medical procedures concerning patients with rectal bleeding in general practice.

Our findings indicate that the majority of patients presenting with the symptom of rectal bleeding were referred from their GP to a specialist for further diagnostic tests. Colonoscopies were the primary diagnostic measures utilised. Although a complete colonoscopy is desirable, the terminal ileum was not examined in 37.4% \((n = 73)\) of all colonoscopies performed \((n = 195)\). It is important to note that in 27 patients aged 50 years and above, GPs diagnosed haemorrhoids and other

### Table 2. New confirmed diagnoses following the symptom of rectal bleeding.

<table>
<thead>
<tr>
<th></th>
<th>&lt;50 years (total = 153)</th>
<th>≥50 years (total = 268)</th>
<th>Total (total = 422)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n (%))</td>
<td>(n (%))</td>
<td>(n (%))</td>
</tr>
<tr>
<td>Colon carcinoma</td>
<td>2 (1.3)</td>
<td>15 (5.6)</td>
<td>17 (4.0)</td>
</tr>
<tr>
<td>Crohn’s disease</td>
<td>2 (1.3)</td>
<td>0</td>
<td>2 (0.5)</td>
</tr>
<tr>
<td>Ulcerative colitis</td>
<td>6 (3.9)</td>
<td>2 (0.7)</td>
<td>8 (1.9)</td>
</tr>
<tr>
<td>Undetermined colitis</td>
<td>4 (2.6)</td>
<td>7 (2.6)</td>
<td>12* (2.9)</td>
</tr>
<tr>
<td>Other colitis types</td>
<td>3 (2.0)</td>
<td>6 (2.2)</td>
<td>9 (2.1)</td>
</tr>
<tr>
<td>Bowel polyps</td>
<td>3 (2.0)</td>
<td>42 (15.7)</td>
<td>45 (10.7)</td>
</tr>
<tr>
<td>Carcinoma in situ</td>
<td>1 (0.7)</td>
<td>2 (0.7)</td>
<td>3 (0.7)</td>
</tr>
<tr>
<td>Non-colorectal cancer</td>
<td>0</td>
<td>2 (0.7)</td>
<td>2 (0.5)</td>
</tr>
<tr>
<td>Diverticulosis/diverticulitis</td>
<td>7 (4.6)</td>
<td>33 (12.3)</td>
<td>40 (9.5)</td>
</tr>
<tr>
<td>Irritable bowel syndrome</td>
<td>4 (2.6)</td>
<td>3 (1.1)</td>
<td>7 (1.7)</td>
</tr>
<tr>
<td>Haemorrhoids</td>
<td>44 (28.8)</td>
<td>66 (24.6)</td>
<td>110 (26.1)</td>
</tr>
<tr>
<td>Anal fissure</td>
<td>6 (3.9)</td>
<td>6 (2.2)</td>
<td>12 (2.9)</td>
</tr>
<tr>
<td>Upper gastrointestinal tract disorder</td>
<td>11 (7.2)</td>
<td>26 (9.7)</td>
<td>37 (8.8)</td>
</tr>
<tr>
<td>Other diagnoses</td>
<td>12 (7.8)</td>
<td>25 (9.3)</td>
<td>37 (8.8)</td>
</tr>
</tbody>
</table>

*One patient with unknown age.

### Table 3. Symptom pattern of rectal bleeding in patients ≥50 years not referred to a specialist \((n = 27)\).

<table>
<thead>
<tr>
<th></th>
<th>Without complaints</th>
<th>Abdominal pain</th>
<th>Congestion</th>
<th>Discomfort when bowel movement</th>
<th>Changed bowel habits</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bright red bleeding</td>
<td>12</td>
<td>5</td>
<td>–</td>
<td>2</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>Blood mixed with stool</td>
<td>–</td>
<td>1</td>
<td>–</td>
<td>–</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Blood on stool</td>
<td>2</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>2</td>
</tr>
<tr>
<td>FOBT screening</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>–</td>
<td>–</td>
<td>4</td>
</tr>
</tbody>
</table>

FOBT = faecal occult blood test.
Clinical information regarding patients’ histories was not entered by the participating GPs. This could have occurred when medical information of specialists was not transmitted back to the GP practice. Another possible source of error could be the physicians’ lack of experience with internet-based data entry and employing the computer template as designed. As the participating GPs randomly received only three of the five entering criteria, an epidemiological conclusion about the frequency of severe diagnoses was not intended from the study’s outline.

Comparison with existing literature
Our results point out that GPs undertake a broad number of interventions in general practice to clarify the cause of rectal bleeding. However, for a small number of patients aged 50 years and above, relevant diagnostic measures were not accomplished in relation to positive a FOBT test. Four of these patients had a positive FOBT test. Clinical information regarding patients’ histories was not entered by the participating GPs. This could have occurred when medical information of specialists was not transmitted back to the GP practice.

Benign proctologic diseases without having conducted further diagnostics. Four of these patients had a positive FOBT test.

Strengths and limitations of this study
The median number of 9 years spent working in general practice indicates that the survey was performed with experienced GPs. With regard to the number of registered patients with rectal bleeding, after monitoring the GP practices, we found no sign of under-reporting. Taking into consideration that the public has paid more and more attention to the early detection of colorectal cancer over recent years, we conclude that not only patients but also physicians have become well aware of the importance of reporting rectal bleeding. This leads to our conclusion that most patients with rectal bleeding have been documented by the participating GPs. The physicians were able to complete relevant data collection for a period of 3 months following the end of the study. We suggest that no further diagnostic evaluation related to the presentation of rectal bleeding was performed by the GPs during that time.

However, diagnostic procedures of the gastrointestinal tract performed prior to the commencement of the study were not recorded in the survey. It has to be mentioned that some clinical information regarding patients’ histories was not entered by the participating GPs. This could have occurred when medical information of specialists was not transmitted back to the GP practice.

Another possible source of error could be the physicians’ lack of experience with internet-based data entry and employing the computer template as designed. As the participating GPs randomly received only three of the five entering criteria, an epidemiological conclusion about the frequency of severe diagnoses was not intended from the study’s outline.

Heintze et al addressed validity but neglected to consider reliability (reproducibility). Inter-rater reliability is a particular issue in such a large scale study as other work has indicated that some symptoms of possible oncological significance are more reliable than others. Clearly, future work should be designed to assess reliability and representativeness in addition to validity.

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REFERENCES
combined flexible sigmoidoscopy plus barium enema X-ray in patients with positive FOB.T,11,18 German guidelines recommend a colonoscopy with each positive FOB1 test.10

A matter of particular interest was the symptom pattern of rectal bleeding in patients aged 50 years and above without further diagnostic evaluation. The measures taken by the GPs in this study correspond closely to the recommendations of the referral guidelines for suspected cancer of the British NHS.11 It might have been appropriate for most of these patients not to be referred for further investigation, but opinions about the need for further diagnostic measures, particularly in patients aged 50 years and above with visible rectal bleeding, are contrary. It is not possible, merely from an anal examination, to be certain that rectal bleeding necessarily originates from a simple anal lesion, such as haemorrhoids. These lesions may coexist with colorectal adenoma or cancer. Different recommendations concerning further diagnostic procedures in patients with rectal bleeding in association with a change in bowel habits or abdominal pain,11,19 make it complex for GPs to decide whether a referral process might be appropriate or not.

Due to an initiative of German health insurers, patients over the age of 55 years have the option of being referred for a screening colonoscopy even without showing bowel-related symptoms.10 This is an extension to guidelines that recommend investigations based on specific symptoms only. We conclude that patients aged 50 years and above, with symptoms whereby the presence of colorectal cancer or polyps could not be excluded by other means, should have appropriate further diagnostic evaluation.

**Implications for future research and clinical practice**

Specific clinical indications for colonoscopies or complete diagnostic evaluation could help GPs to decide whether or not to conduct further diagnostic procedures in patients with visible rectal bleeding. Future surveys should address which symptom pattern related to rectal bleeding should undergo additional diagnostic processes.

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**Ethics committee and reference number**
Charité Universitätsmedizin ethics board (Reference number 1386)

**Competing interests**
None

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**REFERENCES**


