Cancer physicians’ attitudes toward colorectal cancer follow-up

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Background: The optimal follow-up strategy for colorectal cancer is unknown.

Materials and methods: We surveyed all Canadian radiation oncologists, medical oncologists and surgeons specializing in colorectal cancer to assess their recommendations for follow-up after potentially curative treatment, the beliefs and attitudes underlying these practices, and the cost implications of different follow-up strategies.

Results: One hundred and sixty practitioners (58%) returned completed surveys. Most recommended clinical assessments every 3–4 months in the first 2 years including carcino-embryonic antigen testing, gradually decreasing in frequency over 5 years. Ninety per cent recommend a surveillance colonoscopy in the first year. The majority felt that specialist involvement in follow-up was important because of the increased opportunities for patients to contribute to research (76%) and teaching (73%). About half felt that specialists were more efficient at providing follow-up than primary care physicians, but these same physicians recommended significantly longer and more expensive follow-up routines on average than others. Primary care physicians were felt to be important allies, especially in managing the psychosocial concerns of patients.

Conclusions: Surveillance practices are generally in keeping with published recommendations. Most specialists feel that they should remain involved in follow-up, but this may result in increased resource utilization.

Key words: colorectal cancer, costs, follow-up, physician survey

Introduction

Colorectal cancer (CRC) is the fourth most common cancer and the second leading cause of cancer death in North America [1, 2]. Although 38% of people diagnosed with CRC will eventually die from the disease [2], over 75% initially present with potentially curable stage I, II or III cancer [1, 3, 4]. After definitive surgery, patients with stage I or II colon cancer usually receive no further treatment, while patients with stage III colon cancer routinely receive at least 6 months of adjuvant chemotherapy [5, 6]. Patients with stages II or III rectal cancer receive either preoperative or postoperative combined chemo-radiotherapy [7].

Regardless of the form of primary treatment, it is unclear how best to follow CRC patients afterwards. Routine follow-up aims to: (i) detect new pre-cancerous lesions in the colon; (ii) identify recurrent metastatic disease to the liver or lung at a time when potentially curative surgical resection is possible [8]; and (iii) provide psychosocial support. However, the medical literature has not clearly demonstrated improvement in any of these outcomes as a result of follow-up surveillance. This has led to conflicting recommendations of how follow-up should be carried out [8, 9] and who should carry it out [10–12], and questions about the cost-effectiveness of different follow-up practices [13–15]. Because of this uncertainty, we undertook a national survey of all Canadian physicians (surgeons, radiation oncologists and medical oncologists) who could be identified as specializing in CRC, in order to assess empirically the current standards of follow-up care and the attitudes and beliefs behind these practices, and to estimate the impact of different patterns of practice on costs.

Materials and methods

Questionnaires

We developed a standardized questionnaire based on a survey instrument used previously to measure follow-up practices for breast cancer, modified for CRC [10, 11]. Pilot testing and survey revision was carried out with a sample of 20 surgical, radiation and medical oncologists affiliated with the Ottawa Regional Cancer Center. Respondents were given a hypothetical scenario of a 50-year-old man who is otherwise healthy and who has just successfully completed adjuvant chemotherapy for stage III (Dukes’ C) colon cancer. They were asked to describe the frequency (number of visits per year) and duration (number of years) of follow-up visits they would ordinarily perform. They were also asked to indicate the frequency with which they would order the following tests each year during the first 5 years of surveillance: colonoscopy, complete blood count (CBC), liver function tests (LFT), carcino-embryonic antigen (CEA), chest X-ray, abdominal ultrasound, abdominal computed tomography (CT) scan, fecal occult blood (FOB) or air...
contrast barium enema (ACBE). Respondents were asked to describe the frequency of each of their follow-up practices in terms of monthly, every 3–4 months, every 6 months, yearly or other pattern of testing. If ‘other’, there was a space on the survey to write in the frequency. Where possible, these were incorporated in the nearest category. Otherwise, they were analyzed as their own category. If their practice was to discharge patients to another physician after primary treatment, they were asked to answer according to the follow-up regimen they would recommend to that physician. Questions were also included to assess attitudes about the benefits of follow-up. These were posed as statements with which respondents could ‘Strongly agree’, ‘Agree’, ‘Disagree’ or ‘Strongly disagree.’ For analytic purposes, responses were dichotomized between the first two and last two categories. Socio-demographic characteristics were also elicited. The surveys were mailed and one follow-up reminder sent 8 weeks later if not returned. No remuneration was provided.

Sample

The questionnaires were mailed to a national sample of cancer specialists: all members of the Canadian Association of Radiation Oncologists (CARO); all members of the Canadian Association of Medical Oncologists (CAMO); and, because there is not a national association of surgical oncologists in Canada, all surgeons who had referred a patient to a National Cancer Institute of Canada (NCIC) CRC study. Respondents were considered ineligible if they indicated that their practice did not principally involve CRC patients, or if they had left the position to which the survey was mailed.

Cost analysis

Estimates of the average cost per patient for 5 years of follow-up were calculated based on the average frequency of visits and investigations recommended by respondents. Estimates were also calculated for different subgroups of respondents, for example by subspecialty. Unit costs of follow-up visits and investigations were taken from the fee schedule of the Ontario Health Insurance Plan [16] and inflated to constant 2002 Canadian dollars with the Consumer Price Index [17].

Statistical analysis

The sample provided an 80% power to detect a 5% difference across comparison groups for most analyses. Data from the surveys were coded and entered into a computerized database. As almost all responses were categorical, comparisons among the specialties were carried out using a chi-square analysis. Costs of treatment programs among physicians responding differently to the dichotomized attitude categories were compared using a t-test, while an analysis of variance compared the costs of different specialists’ follow-up. All statistical analyses were carried out using the Statistical Analysis Software (SAS), version 8.1 for Windows (SAS Institute Inc., Cary, NC, USA, 1999).

Results

A total of 531 surveys were mailed (92 surgical oncologists, 195 radiation oncologists and 244 medical oncologists), of which 256 returned the questionnaire but identified themselves as ineligible because their practice does not include CRC patients (27 surgical oncologists, 109 radiation oncologists, and 120 medical oncologists). We received completed surveys from 46 surgeons, 50 radiation oncologists and 64 medical oncologists, giving adjusted response rates of 71%, 58% and 52%, respectively. The overall adjusted response rate was 58% (160/275).

The mean age of respondents was 46 years, ranging from 30 to 66. Most were men—133 (83%) and most—102 (64%)—were in academic practices. The average year of graduation from medical school was 1975 (median 1976), ranging from 1938 to 1991. Respondents reported seeing on average 3.3 new stage III colon cancer patients per month. The majority of our 108 respondents (68%) spent more than 60% of their time in direct clinical care.

Follow-up practices

Only two respondents (1.3%) agreed with a practice of no routine follow-up, advising patients to return to clinic if they developed symptoms. However, 103 (64%) stated that they routinely discharge patients at some point to their primary care physicians for follow-up. Only 12 (7.5%) did so immediately after completing primary therapy. Results were similar when these 11 medical oncologists and one surgeon were excluded. Sixty (38%) physicians discharged patients after 5 years, while 18 (11%) reported following patients for 10 years before discharging them from their clinics. Only 43 (27%) agreed with routine follow-up being performed entirely by primary care physicians who would refer patients back to their surgeon or oncologist on an as needed basis. Of the medical oncologists 27 (42%) agreed with this, significantly more than either radiation oncologists 11 (22%) or the five surgeons (11%), ($P <0.001). However, 106 respondents (66%), similarly distributed across the specialties, agreed that alternating follow-up between primary care physicians and specialists was appropriate.

Figure 1 shows follow-up patterns over time. Most physicians reported that they would routinely see a patient with stage III CRC every 3–4 months in the first (115 respondents, 72%) and second (80 respondents, 50%) years, although by the second year, 59 (37%) were following patients only every 6 months. Only two respondents (1.3%) suggested monthly follow-up in the first year, and none did after that. In the third year, 109 (68%) would routinely see patients only every 6 months, but by the fourth year, 93 (58%) had reduced their follow-up to every 6 months, and 54 (33%) had decreased the frequency further to yearly. In year five, doctors were fairly evenly split with 67 (42%) still seeing patients every 6 months and 77 (48%) seeing them yearly. Medical
oncologists tended to recommend more frequent follow-up in later years.

Blood tests, including CBC, liver function studies and CEA were recommended at almost every visit, while other tests were generally only performed once or twice per year. All testing gradually decreased in frequency over time (as shown in Figure 2). There were only a few differences in the recommendations made by different types of subspecialists. Surgeons were more likely to order regular abdominal imaging (65%, versus 24% of radiation and 36% of medical oncologists; P <0.001), and only 78% of radiation oncologists recommended surveillance colonoscopy in the first year, compared with 97% of medical oncologists and 93% of surgeons (P <0.05). Radiation oncologists were also significantly less likely than those of other specialties to agree with the statement “Routine follow-up is an effective way of detecting new primary colorectal cancers” (P <0.05).

Follow-up practices differed according to the initial stage of the cancer. When asked to which other stages these follow-up practices would apply, only 31 (19%) respondents said they would apply the same follow-up routine to patients with Dukes’ stage A disease (confined to the mucosa). However, 74 (46%) would apply the same follow-up routine for patients with Dukes’ B1 tumors (penetrating the mucosa), and 143 (89%) to patients with Dukes’ B2 (stage II, penetrating through the muscularis propria but not involving lymph nodes). All but 42 (74%) indicated that they use a similar follow-up procedure for rectal cancer.

**Cost of follow-up**

Using the utilization frequencies reported in the survey, we were able to estimate the average cost of 5 years of follow-up carried out by this group of doctors (Table 1). Costs decreased with each successive year as follow-up became less intense. Medical oncologists’ follow-up routines would cost an average of $2310, while those suggested by radiation and surgical oncologists would cost $1783 and $1940, respectively (not statistically different).

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean cost ($)</th>
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<tbody>
<tr>
<td>Year 1</td>
<td>445</td>
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<tr>
<td>Year 2</td>
<td>391</td>
</tr>
<tr>
<td>Year 3</td>
<td>287</td>
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<td>Year 4</td>
<td>262</td>
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<tr>
<td>Year 5</td>
<td>237</td>
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<tr>
<td>Mean 5-year cost*</td>
<td>2019</td>
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*This represents the average total cost over the first 5 years for the programs recommended by respondents, including those who suggested follow-up for less than 5 years. Consequently, it does not equal the sum of the years above it in the table.

**Attitudes towards follow-up**

While 142 (89%) responded that routine follow-up was an effective way to detect a new primary CRC and 104 (65%) thought that finding local recurrences improved survival, only 57 (36%) respondents agreed that routine follow-up is cost-effective. Most —95 (60%) —felt that follow-up is effective for finding occult distant recurrences, but only 46 (29%) thought that detecting such recurrences early improves survival.

Specialist care was felt to increase the opportunities for patients to participate in research for 121 (76%) respondents, and 117 (73%) said that having follow-up patients in specialty clinics was an important teaching experience for junior housestaff. Only 42 (66%) medical oncologists felt that research was an important reason for follow-up, however, compared with 39 (78%) radiation oncologists and 40 (90%) surgeons (P <0.05). Ensuring that the patient remains ‘in the system’ to facilitate care should a recurrence develop was cited as an important reason for follow-up by 90 (57%) respondents. One hundred and nine (68%) cited the importance of keeping in personal touch with their patients as a reason for follow-up. Surgeons felt particularly strongly about this, with 42 (91%) agreeing with the statement, compared with only 32 (64%) radiation oncologists and 35 (55%) medical oncologists (P <0.005). Physicians expressing these views also recommended follow-up programs that were significantly more costly —up to $2199 per patient on average—mostly due to longer recommended follow-up.

About half of the respondents (79) felt that specialists were more efficient at providing follow-up care than primary care physicians, because they were less likely to order unnecessary tests such as bone scans. However, 139 (87%) physicians agreeing with statements that favored specialist follow-up, such as those who did not think that patients would rather go to their primary care physician for follow-up, or who felt that generalist follow-up was no less stressful than specialist follow-up (90 respondents, 56%), also recommended significantly longer and more expensive follow-up routines (up to $2412 over 5 years). Furthermore, 138 (86%) thought that patients expect follow-up by a specialist. However, 89 (56%) allowed that primary care physicians have the skills to provide follow-up, 147 (92%) would
refer patients back if a recurrence developed, and 87 (55%) acknowledged that primary care physicians were generally better at psychosocial support than specialists.

Discussion

Follow-up for CRC remains a controversial issue. Unlike other solid tumors such as lung or breast cancer, a small proportion of CRC patients with isolated metastases can be cured with surgery [18, 19]. This makes early detection of recurrences potentially desirable. However, because the yield is small, some investigators question whether the expense and anxiety of intense monitoring is justified [20, 21]. Of patients who receive definitive treatment for stage II or III CRC, approximately 50% will eventually relapse [22–27]. A maximum of 10–15% will recur with potentially resectable metastases, and about a third of those will be cured [18]. Therefore, only about 3–5% of CRC patients can be cured by identification and resection of isolated metastases. Because approximately 60% of patients with isolated metastases seek medical attention on their own due to symptoms, the maximum benefit follow-up could have to identify these early recurrences is only about 2%. Trials to detect such a small difference would need to be very large.

There have been six randomized trials comparing different follow-up strategies [28–33]. Only one had a ‘no follow-up’ control arm [29]: the others compared more aggressive with less aggressive surveillance. Although only one trial showed significantly improved survival for the more aggressive follow-up [33], others showed at least a trend in favor of more follow-up [29–32]. Some of these studies had insufficient sample size to detect small differences in survival, however [32]. A meta-analysis of non-randomized trials was unable to reach a definite conclusion about the benefit of follow-up, although the subgroup of trials including CEA had a small but significant reduction in the odds of death [34]. More recent meta-analyses of randomized trials have indicated that trials in which patients received more intensive follow-up showed more of a survival advantage than trials with less intensive follow-up [35–37]. There has also been demonstration of more pronounced benefit for protocols with liver imaging [36, 37], indicating that follow-up can impact survival by detecting extramural recurrences. Many evidence-based guidelines do not yet recommend routine intensive surveillance, however [8, 9, 38].

There has been considerable controversy over the value of CEA testing. CEA is a cell adhesion glycoprotein that is over-expressed by adenocarcinomas and can be detected in the serum. The serum CEA level often rises before other biochemical tests become abnormal from metastases. However, about 30% of all CRC recurrences do not produce CEA [39], especially poorly differentiated tumors [40]. Furthermore, CEA elevation can be due to other causes such as smoking, hepatitis and colitis. A trial by Northover et al. tried to define the benefit of CEA but unfortunately it has not been fully published [41]. In their trial, 1500 patients were followed clinically and with CEA determinations, and were randomized as to whether or not the CEA result would be disclosed to their physician. Patients with a disclosed elevated level then underwent an aggressive assessment for recurrent disease that might include a laparotomy if necessary. The trial was stopped early because “it was highly unlikely that any survival advantage would be demonstrated for patients undergoing second-look surgery” [28]. However, a CEA elevation in this study was defined very stringently as two determinations greater than 20 ng/ml or two values above 10 ng/ml with an increase of 7 ng/ml from previous levels. This may have delayed investigation sufficiently to negate any potential benefits. Furthermore, the morbidity and mortality from laparotomies may have counterbalanced survival benefits from curative resections. A recent meta-analysis has suggested that follow-up regimens including CEA determination have provided benefit in randomized trials [36]. Illustrating the uncertainty, evidence-based guidelines come to different conclusions regarding the role of CEA in follow-up, some recommending regular use of CEA testing [8, 38], others recommending against it [9, 42].

The main difference in the practices of the specialists we surveyed, compared with published practice guidelines [8], lies in the relatively frequent use of imaging studies. The intensity of follow-up reported by our respondents was similar to that reported in an American survey of surgeons [43], and in a study that linked Medicare files to the Survival, Epidemiology, and End Results (SEER) tumor registry to identify the follow-up tests in routine use among elderly CRC patients [44]. However, the follow-up in both of these studies, as well as ours, was much more intense than that found by Mella et al. in Britain [45], where only 33.5% of surgeons routinely carried out investigation to detect asymptomatic metastases. Similarly, Foster et al. had reported results 10 years earlier from Wales and south west England that only a quarter of physicians followed CEA levels to find early metastatic disease [46]. All of these studies have noted a lack of consensus and variation in practice amongst physicians, which probably reflects the uncertainty about the usefulness of follow-up testing.

Whether follow-up provides important psychosocial support is debatable [12, 47], and probably varies on a patient-by-patient basis. Any benefit must be considered in balance with the anxiety, inconvenience, and discomfort associated with frequent clinic visits, tests and potentially false-positive results. A recent randomized study of breast cancer follow-up indicated that patients may actually prefer to see their primary physician rather than a specialist [12]. These factors may decrease compliance with an intensive follow-up regimen carried out by specialists, thus eroding its benefits. Other rationales for follow-up include the ability to begin palliative chemotherapy for advanced disease at a time when the patient is still well enough to tolerate it, and to avert impending complications from otherwise unrecognized metastases. The former rationale is becoming more important as advances in palliative chemotherapeutics begin to demonstrate survival advantages [48–50]. Whether specialists or generalists are better suited to carry out follow-up is debatable. While many of the specialists in our study commented on the role of follow-up to facilitate research, most estimates indicate that only a few per cent of all adult cancer patients are ever enrolled in a clinical trial [51].
Our average cost estimate of $2019 per patient over 5 years is similar to others reported in the literature [20, 21, 52]. Twenty years ago, Sandler et al. estimated costs of $372 (1982 charges to a local American hospital), including downstream investigations and procedures, to follow patients in the first 2 years [53]. Moertel et al. reported a total cost of $1438739 for 1017 patients ($1415 per patient) followed for a median of 6 years, based on 1991 charges to American private insurers, and including the cost of subsequent interventions [20]. Virgo et al. counted the Medicare-allowed charges for different follow-up strategies over a 5 year time horizon, finding that charges ranged from $561 (1992 US dollars) for a minimal strategy that simply surveyed the colon for new primaries, $6709 for a middle strategy that added clinical evaluation and blood work, including CEA, to $16492 for an intensive strategy that involved abdominal imaging [52]. Edelman et al., also using 1995 US Medicare charges, reached an estimate of $1100 for 5 years of a screening program similar to that suggested by most of our respondents [21]. In 1997, Norum and Olsen reported an estimate of 1232 British pounds for a 48-month follow-up program in Norway [15]. Adjusting for differences in costs including time horizon, currency and inflation, our costs may actually be at the low end of some of these reported estimates, probably because of lower health care costs in Canada relative to the US in particular, and lesser use of imaging in follow-up strategies. While the cost may not seem excessive, with about 11000 new cases of stage II and III CRC in Canada each year [2], the overall follow-up of all CRC is a substantial burden on the healthcare system. A common proposal to reduce these costs is to shift follow-up into the primary care setting, as there is a perception that specialist care is more intense and therefore more expensive. In support of this, physicians in our survey who were most averse to generalist follow-up did tend to propose more expensive follow-up strategies.

There are some limitations to our study. Although our response rate and subsequent sample size was good and better than for other similar studies [43, 45, 46, 54], the sample size was smaller than some [43] and may have limited our power. Also, the practices of non-responders may be different from those who completed the survey. Our estimates of practice patterns were based entirely on self-report; we were not able to independently verify the follow-up programs claimed. Most cancer specialists in Canada are in academic practices and this was reflected in our sample, but follow-up may differ in private practice. Furthermore, we only looked at the practices of specialists and did not assess the practices of generalist physicians already doing CRC follow-up.

The evidence dealing with follow-up is unclear. Nevertheless, there seems to be a consistent message emerging from the literature that some sort of follow-up is beneficial [8, 37, 43, 55, 56]. Whether follow-up is best accomplished in the primary or tertiary care setting is not known, but it is likely that both specialist and generalist physicians have different contributions to make to high quality care for cancer survivors. For example, oncologists may be more attuned to the implications of a new symptom that could portend a cancer recurrence, while primary care physicians may be better able to handle the psychosocial concerns of their patients and to provide general non-cancer health maintenance. Such care must be coordinated and judicious, however, in order to minimize the economic impact of post-treatment surveillance on health care budgets.

Acknowledgements

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References