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Paper

Is the "red flag" referral pathway effective in diagnosing colorectal carcinoma?

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ABSTRACT

Introduction: In 2000-2004 there were, on average, 938 new cases of colorectal cancer (CRC) diagnosed per annum in Northern Ireland, accounting for 13.9% of all cancers. The two week "red flag" referral system aims to detect 90% of patients with CRC for prompt treatment. The aim of this study is to examine the impact of the "red flag" referral system on identification of patients with CRC, time to treatment and stage of disease.

Methods: A random sample of 200 patients referred via the "red flag" system was identified from the local cancer patient tracker database. Data pertaining to demographics, time to hospital appointment, appropriateness of referral and diagnosis were collected. For patients identified with CRC, the stage of disease and time to first definitive treatment were also documented.

Results: Of the 200 patients, 56% were female. The age range was 27 - 93 years. Eighty three percent were seen within 14 days of referral. Referrals adhered to the guidelines in 45% of cases. There were 4 pancreatic cancers, 1 endometrial cancer, 1 ovarian cancer and 1 myelodysplasia diagnosed. Three patients were diagnosed with CRC (1.5%). Of these, 1 was palliative and the remaining 2 commenced definitive management within 6 days of decision to treat.

Conclusion: The "red flag" referral system does not appear to be effective in identifying patients with CRC but did identify patients with other types of cancer. Less than half of the referrals adhered to the guidelines. A review of this system should be undertaken.

Key words: Colorectal cancer; Referral criteria; Diagnosis; Guidelines

INTRODUCTION

Colorectal carcinoma is the second commonest malignancy in women and third commonest malignancy in men in the United Kingdom[1,2]. In 2000-2004 there were 938 new cases of colorectal cancer diagnosed per annum in Northern Ireland, accounting for 13.9% of all cancers. The overall 5 year survival rate is 53.7%[3].

The two week "red flag" referral service arose from the NHS Cancer Plan in 2000 and the intention was to detect 90% of patients with colorectal cancer for prompt treatment[1,2,4-7]. This referral system was introduced in Northern Ireland in May 2007. To facilitate these referrals, guidelines have been established detailing high risk criteria for patients with suspected colorectal cancer[8,9]. (See Table 1). Previous studies have shown that when the guidelines are adhered to, the diagnostic yield for colorectal cancer is greater[6,10,11].

Patients referred via the "red flag" pathway must be seen by a hospital specialist within 14 days of referral and 95% of these patients who are identified as having colorectal cancer should begin their definitive treatment within 62 days of referral[8].

The aim of this study is to examine the impact of the "red flag" referral pathway on identification of patients with colorectal cancer, time to treatment and stage of disease.

METHODS

All consecutive adult patients with suspected colorectal cancer referred via the "red flag" referral pathway to a single unit over a one year period (1 April 2009 – 31 March 2010) were identified retrospectively from the local cancer patient tracker database. A total of 522 "red flag" referrals were identified. A random sample of 200 patients was selected by the audit department for analysis. Information was collected retrospectively from the medical notes. Time to be seen by a hospital specialist was calculated from the date of the GP referral letter to the date of first specialist outpatient appointment. Data was collected from the referral letters and compared with referral guidelines (Table 1) to establish if the "red flag" referral was appropriate. For those patients diagnosed with colorectal cancer, the stage of disease and time to first definitive treatment were also analysed.

A literature search was performed using Medline (key words "two week rule" and "colorectal cancer") and backward chaining from articles obtained.

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RESULTS

Of the 200 patients included in the study, 112 (56%) were female and 88 (44%) were male. The age range was 27 - 93 years with a median age of 68 years. Eighty three percent of patients were seen within 14 days of referral with a median time to appointment of 7 days. Referrals were consistent with the guidelines in only 45% of cases. Fourteen patients (7%) had normal investigations. One hundred and ninety patients (95%) had a benign diagnosis, the most common of which was diverticular disease (26.5%). The most common benign diagnoses are detailed in Table 2. Four patients had pancreatic carcinoma, 1 patient had endometrial carcinoma, 1 had ovarian carcinoma and a further patient was diagnosed with myelodysplasia. Three patients were diagnosed with colorectal carcinoma (1.5%). Two of these patients had a left sided malignancy (Duke's C & Duke's D). The remaining patient had a tumour in the right colon (Duke's B). Of these, 1 patient was palliative and the remaining 2 patients started treatment within 6 days of the decision to treat.

DISCUSSION

The two week "red flag" referral service was implemented to try to detect patients with colorectal cancer for early treatment[1,2,4-7] and guidelines were implemented to facilitate this[8,9] (see Table 1). This study shows that a large proportion of referrals do not adhere to the guidelines and the diagnostic yield for colorectal carcinoma is low. This lack of adherence to the guidelines is reflected in other studies in this area with non-compliance rates varying from 37.9 - 49.6%[6,10-12]. There may be several reasons for this including lack of time in the primary care consultation, less familiarity with colorectal history taking or a change in the patient's recollection of their symptoms[13].

The low diagnostic yield of "red flag" referrals for suspected colorectal cancer is well documented with pick-up rates of 3 - 14% being quoted in the literature[2,4,6,7,10,12-15]. This may be due to the referral of a large number of patients who do not adhere to the guidelines[4].

Of note, when the guidelines are adhered to, the diagnostic yield for colorectal cancer is greater. In a study carried out by Flashman *et al*[6] looking at all patients referred to a "two week rule" clinic in a 1 year period, 9.4% of patients were diagnosed with colorectal cancer, comprising 26.1% of all colorectal cancer diagnoses made in that time period. The diagnostic yield was greater in the "two week rule" clinic compared with the routine clinic (9.4% vs 2.2%; p<0.0001). The authors also found that 85% of the colorectal cancers referred fulfilled at least one of the referral criteria therefore suggesting that the guidelines are valid if adhered to.

Similarly, Debnath *et al*[10] found that a colorectal cancer diagnosis was of higher frequency in those referrals that complied with the guidelines. Eccersley *et al*[11] found that 25% of those patients that fulfill the referral criteria are diagnosed with colorectal cancer, supporting the view that the criteria must be firmly adhered to[7]. This may be improved by improving education in the primary care sector with regards to the high risk criteria for colorectal cancer and the importance of not referring patients with transient symptoms or symptoms lasting longer than 18 months via this referral pathway[10]. Also, an increased awareness of the diagnostic value of rectal bleeding without anal symptoms[6] and the importance of digital rectal examination may increase diagnostic yield. In a study carried out in North Middlesex University Hospital[1], 45% of referrals had no documented evidence of clinical examination. Just over half (56.7%) had no documented digital rectal examination and, of these, one third were found to have a palpable rectal tumour at outpatient appointment. Also worryingly, 30.6% of those with a documented normal digital rectal examination had a palpable rectal tumour at clinic. Other methods to improve adherence to referral guidelines may include triage of the "red flag" referral letters by clinicians although this will add to an already heavy workload and may not screen out unnecessary referrals if the information provided is inaccurate. Specific referral letter for colorectal cancer could be introduced[10] but this may only add to an already overwhelming amount of paperwork in the general practitioner's workload.

In our study, 3.5% of patients were diagnosed with other malignancies, lending some support to the view that the guidelines do appear to be effective in identifying a malignant process in the patients referred[11].

Table 1:

Red flag referral criteria

	Symptoms & signs for red flag referral
1	Persistent rectal bleeding for 6 weeks without anal symptoms (>60 yrs)
2	Change in bowel habit to looser stools/increased frequency for 6 weeks (>60 yrs)
3	Change in bowel habit to looser stools/increased frequency and rectal bleeding (>40 yrs)
4	Palpable right iliac fossa mass
5	Palpable rectal mass (intraluminal)
6	Unexplained iron deficiency anaemia (Hb<11g/dL men, <10g/dL non-menstruating women)

Table 2:

Common diagnoses

Diagnosis	Number of patients (%)
Diverticular disease	53 (26.5)
Haemorrhoids	39 (19.5)
Colonic/rectal polyps	17 (8.5)
Functional/IBS	17 (8.5)
Constipation	16 (8)
Normal investigations	14 (7)
Outlet bleeding	8 (4)
Inflammatory bowel disease	7 (3.5)
Diverticular abscess	1 (0.5)
Diverticular bleed	1 (0.5)

Eighty three percent of patients in this study were seen within 14 days of referral which is comparable with figures quoted elsewhere[11]. The age range of patients is similar to that seen elsewhere[6] and again reflects a non-compliance with the referral guidelines.

CONCLUSION

The "red flag" referral system does not appear to be effective in identifying patients with colorectal carcinoma and had a greater yield for patients with other types of cancer. Less than half of the referrals adhered to the guidelines highlighting a need for improved education in the primary care sector with regards to the high risk criteria for colorectal cancer. Other solutions may include introducing a specific proforma for suspected colorectal cancer referrals or perhaps vetting of referrals by clinicians and the letter redirected with an explanation of why the patient does not meet the "red flag" criteria. A review of this system should be undertaken.

The authors have no conflict of interest.

REFERENCES

1. Dua RS, Brown VS, Loukogeorgakis SP, Kallis G, Meleagros, L. The two week rule in colorectal cancer. Can it deliver its promise? *Int J Surg.* 2009; **7(6)**: 521-5.
2. Aljarabah MM, Borley NR, Goodman AJ, Wheeler JM. Referral letters for 2-week wait suspected colorectal cancer do not allow a "straight-to-test" pathway. *Ann Roy Coll Surg Eng.* 2009; **91(2)**: 106-9.
3. Northern Ireland Cancer Registry. Cancer in Ireland 1994-2004: A comprehensive report; 2009. (http://qub.ac.uk/nicr)
4. Thorne K, Hutchings HA, Elwyn G. The effects of the Two-Week Rule on NHS colorectal cancer diagnostic services: a systematic literature review. *BMC Health Serv Res.* 2006; **6**: 43-7.
5. Bevis PM, Donaldson OW, Card M, Durdey P, Thomas MG, Sylvester PA *et al*. The association between referral source and stage of disease in patients with colorectal cancer. *Colorectal Dis.* 2007; **10(1)**: 58-62.
6. Flashman K, O'Leary DP, Senapati A, Thompson MR. The Department of Health's "two week standard" for bowel cancer: is it working? *Gut.* 2004; **53(3)**: 387-91.
7. Baig MK, Marks CG, Stebbings JF, Broughton M. 2-week rule. [Rapid Response to: Referral and diagnostic process in suspected colorectal cancer needs to be improved to achieve two week target. BMJ 2000;321(7275):1527.] *BMJ Online*. 16 January. 2001(1). Available online from: http://www.bmj.com/rapid-response/2011/10/28/2-week-rule. Last accessed April 2012.
8. Northern Ireland Cancer Network. Northern Ireland referral guidance for suspected cancer. Belfast: *NICaN Board.* 2007. Available online from: http://cancerni.net/files/file/ReferralGuidanceMay2007.pdf. Last accessed April 2012.
9. Association of Coloproctologists of Great Britain and Ireland. Guidelines for the management of colorectal cancer. 3rd ed. *Association of Coloproctologists of Great Britain and Ireland.* 2007. Available online from: http://www.acpgbi.org.uk/assets/documents/COLO_guides.pdf. Last accessed April 2012.
10. Debnath D, Dielehner N, Gunning KA. Guidelines, compliance, and effectiveness: a 12 months' audit in an acute district general healthcare trust in the two week rule for suspected colorectal cancer. *Postgrad Med J.* 2002; **78(926)**: 748-51.
11. Eccersley AJ, Wilson EM, Makris A, Novell JR. Referral guidelines for colorectal cancer – do they work? *Ann R Coll Surg Engl.* 2003; **85(2)**: 107-10.
12. Smith RA, Oshin O, McCallum J, Randles J, Kennedy S, Delamere S, *et al*. Outcomes in 2748 patients referred to a colorectal two-week rule clinic. *Colorectal Dis.* 2007; **9(4)**: 340-3.
13. Chohan DP, Goodwin K, Wilkinson S, Miller R, Hall NR. How has the "two-week wait" rule affected the presentation of colorectal cancer? *Colorectal Dis.* 2005; **7(5)**: 450-3.
14. Spencer H, Heeley R, Murray I, Donnelly M. 2 week cancer wait list. [Rapid Response to: Referral and diagnostic process in suspected colorectal cancer needs to be improved to achieve two week target. BMJ 2000;321(7275):1527.] *BMJ Online*. 18 January 2001:(1). Available online from: http://www.bmj.com/content/321/7275/1527.1?tab=responses. Last accessed April 2012.
15. Scott MA, Knight A, Brown K, Novell JR. A single common urgent pathway for all colorectal referrals reduces time to diagnosis and treatment. *Colorectal Dis.* 2006; **8(9)**:766-1.

