

Identifying patients at risk of emergency admission with colorectal cancer

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Introduction

- Emergency presentation of CRC associated with poor outcomes
- Late stage disease
- Physically frail
- Limited success in improving outcomes
 - Perioperative stenting

Previous Studies

- Previous UK based studies
 - One similar study (Scott et al, 1995)
 - Small sample size
 - Unadjusted analysis
 - Other studies (McCardle & Hole et al, 2004)
 - Small sub-group analysis
 - Unadjusted analysis susceptible to confounding
- International Comparisons
 - Large Canadian database study (Rabeneck et al, 2006)

Methods

- Linked clinical data
 - National Bowel Cancer Audit (NBCA)
 - Hospital Episode Statistics (HES)
 - Administrative database of all admissions to hospital
- Identify demographic and clinical risk factors for emergency admission at first presentation of CRC

Participants

- Inclusion Criteria
 - All patients included in NBCA with primary diagnosis of CRC (excluding appendix)
 - 97,909 potential patients
 - August 2007 – July 2011
- Final Cohort
- 82,777 (84%) who could be linked to HES database
- Excluded
 - 230 patients whose mode admission could not be defined

Definition of Data Items

- NBCA
 - Age
 - Sex
 - Cancer site
 - Date of diagnosis
 - Socioeconomic status
 - Index of multiple deprivation (IMD)
- HES data
 - Mode of admission
 - RCS Charlson score to identify co-morbidities
 - Validated tool to identify co-morbidity
 - Ethnicity
 - Procedure information OPCS; Diagnostic information ICD-10

Statistical Analysis

- Descriptive Analysis
- Multivariable logistic regression
 - Adjusted odds ratio's (interpreted as relative risks)
- Missing data
 - Ethnicity; 7,281 patients
 - Socioeconomic status; 40 patients
 - Missing values addressed with multiple imputation

Descriptive findings

- Overall proportion of emergency admissions: 21.6%
 - stable until 2010 21.9%
 - Slightly lower after 2010: 20.9%
- Higher in
 - Elderly (>85) 39.7%
 - Non-white 25.1%
 - Women 24.1%
 - Patients from more deprived backgrounds (IMD quintile 1) 25.9%
 - >2 co-morbidities: 31.0%
 - Dementia 47.7%
 - Cerebrovascular Disease 38.1%
 - Hemi and paraplegia 37.5%
 - Liver Disease 33.8%
 - Congestive Cardiac Disease 35.8%
 - Chronic Renal Disease 31.7%

Adjusted Demographic Risk Factors

		Adjusted odds ratio	Confidence intervals 95%
Year of diagnosis	2011	1	
	2010	1.05	1 to 1.1
	2009	1.06	1.01 to 1.12
	2008	1.09	1.03 to 1.15
Age (year)	50	1.08	1.04 to 1.12
	60	0.90	0.88 to 0.91
	70	1	
	80	1.49	1.47 to 1.52
	90	2.99	2.84 to 3.15
Ethnicity	Non-white	1.13	1.02 to 1.24
Sex	Female	1.12	1.08 to 1.16
IMD quintile	1: Most deprived	1	
	2	0.86	0.82 to 0.91
	3	0.76	0.72 to 0.81
	4	0.70	0.66 to 0.74
	5: Least deprived	0.65	0.61 to 0.69

Adjusted Clinical Risk Factors

Risk Factors	Adjusted odds ratio	Confidence intervals 95%
Dementia	2.46	2.18 to 2.79
Cerebrovascular Disease	1.67	1.49 to 1.87
Hemi/paraplegia	1.41	1.13 to 1.76
Liver Disease	1.87	1.69 to 2.08
Congestive Cardiac Failure	1.49	1.37 to 1.61
Chronic renal Disease	1.23	1.14 to 1.33
Peripheral Vascular Disease	1.16	1.08 to 1.27
Chronic Pulmonary Disease	1.12	1.07 to 1.18
Myocardial Infarction	1.00	0.88 to 1.13
Diabetes Mellitus	0.97	0.92 to 1.02
Rheumatological Disease	0.94	0.83 to 1.07

Summary of findings

- Year of diagnosis
 - Slight evidence of emergency admissions decreasing
- Demographic risk factors
 - Elderly
 - Ethnicity
 - Women
 - Patient from deprived backgrounds
- Clinical risk factors
 - Dementia
 - CVD
 - Hemi and paraplegia
 - Liver Disease

Discussion

- Strengths of Study
 - Largest to date
 - Adjusted analysis
- Limitations
 - Incomplete linkage

Effect of year of diagnosis on emergency admission

- NHS Bowel screening programme started 2006
 - All 58 screening centres by 2012
 - Extension in age to 75 from 2010 onwards
 - Few centres already started
- Increased public awareness
 - Prior to early awareness campaign

Impact of increasing age

- Consistent with multiple other cancers
 - 30% of cancers in over 70's present as an emergency (Ellis-Brooks et al, 2012)
- More likely to be widowed (Scott et al, 1995)
 - Access to healthcare
 - Symptom reporting
- Poorer awareness of signs / symptoms of CRC
 - Cancer awareness and poor compliance with screening (Guessous et al, 2010)

Poorer outcomes in females

- Consistent with other studies:
 - Rabeneck et al (2006)
 - Large population based adjusted analysis in Canada
 - Aversion to endoscopy
 - Increased fear and embarrassment
 - More pain during procedure (Kim et al 2000)

Effect of lower socioeconomic status on emergency admission

- Consistent with other studies (Scott et al 1995; Rabeneck et al, 2006)
- Compliance with screening
 - Higher proportion of tumours among non-participants from more deprived areas (Morris et al, 2012)
- Inequality in healthcare
 - Health seeking behaviour
 - Health service provision
 - Chaturverdi and Ben-Sholmo, 1995

Clinical Risk Factors

- Dementia and Neurological Comorbidity
 - Symptom reporting
 - Cancer awareness
 - Access to healthcare
 - Gupta and Lamont et al 2004; autopsy study
- Other comorbidities
 - Distraction from other symptoms

So What?

- Early recognition
- Targeted screening
 - Increase compliance in 'at risk' patient cohorts
- Primary prevention
 - Public health campaign
 - Be clear on cancer campaign