



A cross-sectional study of the clinical characteristics of cancer patients presenting to one tertiary referral emergency department



Meredith Oatley RN, Grad Cert (Cancer Nursing) (Clinical Nurse Consultant Oncology)^{a,*},
Margaret Fry RN, NP, BAsc, MEd, PhD (Director, Conjoint Professor)^b,
Lesley Mullen RN, BAsc (Nursing) Grad Dip (Critical Care) (Clinical Nurse Educator)^c

^a Clinical Nurse Consultant Oncology, Royal North Shore Hospital, Reserve Road, St Leonards, NSW 2065, Australia

^b Research and Practice Development NSLHD, University of Technology, Sydney, NSW, Australia

^c Emergency Department, Royal North Shore Hospital, Reserve Road, St Leonards, NSW 2065, Australia

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ABSTRACT

Introduction: There is increasing evidence of cancer patients presenting to emergency departments (ED). The study aim was to analyse the characteristics of adult cancer patients presenting to one ED. Understanding cancer patient presentations could assist in the development of new models of care.

Methods: A 12 month retrospective audit was conducted of a random sample of cancer patients. Demographics and characteristic variables were analysed using descriptive, comparative and correlational statistics.

Results: The presentation rate for adult cancer patients was 1110 (2.4%) with 290 sampled. The common symptoms were fever ($n = 54$: 18.6%), abdominal pain ($n = 34$: 11.7%), and shortness of breath ($n = 32$: 11%). The majority of patients were allocated a Triage Category 2 ($n = 94$: 32.4%) or Triage Category 3 ($n = 131$: 45.2%). The majority of patients presented between 2 and 15 times. For patients administered antibiotics the average time was 119.8 minutes ($SD \pm 85.5$). The average ED length of stay was mean 8.08 hours with 271 patients (93.4%) admitted to the hospital. Of the 290 patients, 105 (36.2%) had died within 12 months of ED presentation.

Conclusion: The study has shown that while cancer patients are only a small percentage of ED presentations the vast majority are allocated high triage codes, have high admission rates and high mortality rates.

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1. Introduction and background

Cancer is currently the leading cause of death worldwide and it is expected that 8 million more cancer cases will be diagnosed within the next two decades (WHO, 2014). It is estimated that 28,000 Australians will be diagnosed with cancer in 2014 (Australian Institute of Health and Welfare, 2014). The number of cases of cancer in Australia has doubled in size since 1991 and is the second most common cause of death. The risk of being diagnosed with cancer in Australia is 1 in 2 in males and 1 in 3 in females by the age of 85. The World Health Organization Global Action Plan was launched in 2013 and aimed to reduce mortality from cancer by 25 per cent (WHO, 2014).

Cancer is a chronic disease which contributes significantly to the burden of disease on society (Australian Institute of Health and Welfare, 2014). Emergency Departments (ED) are often the first point of entry for cancer patients requiring urgent care. The advancements

in cancer treatments and subsequent improved survival rates have led to an increase in ED presentations (Vandyk et al., 2012).

From 2012 data Australian Hospital EDs had 6.5 million admissions per year demonstrating an increase of 4.2 per cent between the years of 2007–2008 and 2011–2012 (Australian Institute of Health and Welfare, 2012–2013). Many authors have suggested that cancer patients could seek appropriate treatments in alternative care models rather than accessing EDs (Ahn et al., 2012; Royal College of Physicians, 2013; Ruegg, 2013). Within Australia and New Zealand the majority of patients receive chemotherapy in an outpatient setting and are advised to present to the ED with any symptoms that are unable to be managed at home. Other patients can present to the ED who are subsequently diagnosed with cancer after presenting with symptoms. Therefore, the aim of the study was to explore the trends and characteristics of cancer patient presentations to one ED.

2. Aim

The primary aim of the study was to explore the prevalence and characteristics of adult cancer patients presenting to a tertiary referral hospital ED within the state of New South Wales, Australia.

* Corresponding author. Royal North Shore Hospital, Reserve Road, St Leonards, NSW 2065, Australia. Tel.: +61 0402158169; fax: +61 94632086.

E-mail address: meredith.oatley@health.nsw.gov.au (M. Oatley).

3. Methods

This was a 12 month (1st January 2012–31st December 2012) retrospective cross-sectional study of adult cancer patients. This multi-method audit involved two phases to achieve the proposed research objectives. Phase one included data that were extracted from First Net®, the ED Computer Software Program. The data retrieved included: patient demographic (age, medical record number, gender) and clinical information (arrival time to ED, triage code, doctor seen time, mode of arrival, diagnosis, nurse initiated protocols, admitting doctor, length of stay and discharge disposition). Paediatric presentations were excluded from analysis given that specialist paediatric emergency departments generally manage children with cancer.

Phase two included a random sample that was selected from phase one. The sample size was identified using a 95% CI and 5% margin of error requiring a minimal sample of 286. A medical record audit of adult cancer patients from the ED data set was conducted. Medical records were manually reviewed and the data retrieved included: clinical information (nurse initiated protocols, time to antibiotics, pain score, time to analgesia, date of last chemotherapy and radiotherapy treatment, personal protective equipment, central venous access devices, and discharge disposition).

Data were stored electronically in a security password protected Excel database accessible only by the chief investigators. Descriptive, comparative and correlational statistical analysis was performed with the aid of the IBM SPSS program (IBM SPSS v.21, Chicago, IL, USA).

4. Ethical approval

Ethical approval was obtained from the Northern Sydney Local Health District Human Research Ethics Committee. The ethical conduct of research was maintained during and after the research. All data sources were stored in password protected file and stored in a locked cupboard only accessible by the chief investigators. All patients were immediately de-identified and re-coded to ensure confidentiality, beneficence and privacy.

5. Results

For the 12 month study the ED presentation rate was 62,919 including adults ($n = 47,164$: 75%) and paediatrics ($n = 15,755$: 25%). Of the adult presentations there were 24,048 females (51%) and 23,116 males (49%). The cancer presentation rate was 1110 (2.4%). The medical record audit comprised 290 patients (Table 1). The majority of patients were oncology (255: 87.9%) compared with haematology ($n = 35$: 12%). The majority of patients ($n = 183$: 63%) arrived by private transport and one third of patients ($n = 99$: 34.1%) arrived by ambulance.

Of the 290 patients the average age was 65.3 years and gender was evenly split across the groups (female $n = 146$: 50.3%). The three most common symptoms on presentation were fever ($n = 54$: 18.6%), abdominal pain ($n = 34$: 11.7%) and shortness of breath ($n = 32$: 11.0%) (Table 2). Patients were also found to present due to abnormal test findings ($n = 29$: 10%). The majority of patients ($n = 231$: 79.7%) presented between Monday and Friday and between business hours of 0800 and 1700 ($n = 173$: 59.7%). The majority were allocated Triage Category 2 ($n = 94$: 32.4%) or Triage Category 3 (131: 45.2%). There was no statistical difference in triage code allocation and time of day ($P = .282$) or weekday presentation and gender ($P = .931$) when comparing cancer patients with ED presentations.

The average time for nurse initiated interventions was 25 minutes ($SD \pm 18.5$). The most common nurse initiated intervention was pathology and cannulation ($n = 117$: 40.3%) followed by the administration of analgesics ($n = 54$: 18.6%) and/or antiemetic ($n = 8$: 2.8%).

For those arriving in pain 52 (18%) had a pain score greater than 50 mm (Table 1). The average time to nurse initiated analgesia was 30.7 minutes ($SD \pm 40.9$). There was no statistical difference in time to

Table 1

Characteristics of cancer patient presentations to the ED ($n = 290$).

Group	n	Oncology	Haematology
Gender			
Female	146 (50.4%)	128 (50.20%)	18 (51.43%)
Male	144 (49.6%)	127 (49.80%)	17 (48.57%)
Age			
Mean years (SD)	65.3 (15.3)	65.9 (14.8)	61.3 (16.7)
Triage code			
1	6 (2.07%)	6 (2.07%)	
2	94 (32.41%)	82 (28.28%)	12 (4.14%)
3	131 (50.59%)	115 (39.66%)	16 (5.52%)
4	54 (18.62%)	47 (16.21%)	7 (2.417%)
5	5 (1.72%)	5 (1.72%)	
Top diagnostic groups			
Cancer non defined	104 (35.86%)	104 (35.86%)	
Febrile neutropenia	31 (10.6%)	29 (10.0%)	2 (0.69%)
Pancreatic cancer	20 (6.9%)	20 (6.9%)	
Lung cancer	17 (5.86%)	17 (5.86%)	
Bowel cancer	12 (4.14%)	12 (4.14%)	
Leukaemia		10 (3.45%)	10 (3.45%)
Hodgkin's lymphoma	10 (3.45%)	10 (3.45%)	
Arrival by day			$P = .001 \chi^2$
Weekday	231 (79.7%)		
Weekend	59 (20.3%)		
Monday	51		
Tuesday	40		
Wednesday	49		
Thursday	47		
Friday	44		
Saturday	23		
Sunday	36		
Time of day			
8.00–17.00	173 (59.7%)		
17.01–7.59	117 (40.3%)		
Time to antibiotics			
TTABs minutes mean (SD)	119.8 (85.5 min)	125.6 (87.36)	88.3 (69.21)
Pain Scores			
Presenting with pain	155 (74.1%)		
<50 mm	103 (34.5%)		
>50 mm	52 (18%)		
Time to analgesia			
TTA minutes mean (SD)	47.5 (42.3)	29.9 (41.1)	36.7 (39.6)
Disposition			
Admitted to hospital	271 (93%)	124 (68%)	34 (97.1%)
Transfer to critical care area	5 (1.72%)	1 (0.5%)	
Died in ED	2 (0.69%)	2 (0.78%)	
Transfer to another hospital	3 (1.03%)	2 (0.78%)	1 (2.86%)
Discharged from ED	9 (3.5%)	9 (3.53%)	

Table 2

Presenting symptoms for cancer patients in ED ($n = 290$).

Group	n (%)
Fever	54 (18.62%)
Abdominal pain	34 (11.72%)
Shortness of breath	32 (11.03%)
Abnormal blood tests	29 (10.0%)
Other	26 (8.97%)
Vomiting	16 (5.52%)
Pain	14 (4.83%)
Falls	13 (4.48%)
Dyspnoea	8 (2.76%)
Lethargy	8 (2.76%)
Nausea	7 (2.41%)
Diarrhoea	6 (2.07%)
Mobility	6 (2.07%)
Headache	5 (1.72%)
Dehydration	4 (1.38%)
Myelosuppression	3 (1.03%)
Constipation	3 (1.03%)
Dizziness	3 (1.03%)
Allergy	2 (0.69%)
Fungal infection	2 (0.69%)

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