Widening the scope for early cancer detection: identification of alarm symptoms by community pharmacies

Jay Badenhorst[1], Adam Todd[2*], Laura Lindsey[2], Jonathan Ling[3], Andy Husband[1]

1. Whitworth Chemist Ltd., Scunthorpe, UK.

2. Division of Pharmacy, School of Medicine, Pharmacy and Health, Durham University, UK

3. Department of Pharmacy, Health and Wellbeing, University of Sunderland, UK.

[*]Corresponding author

e-mail: adam.todd@durham.ac.uk

Telephone: +44 (0) 191 3340542

Fax: +44 (0) 191 3340374

Impact of findings on practice

o   Community pharmacy teams should be educated to give appropriate advice to patients reporting potential alarm symptoms;

o   Community pharmacies should have robust referral procedures for patients presenting with alarm symptoms; and,

o   Referral pathways for cancer diagnosis, which include a role for community pharmacy teams could be the subject of further research.

Introduction

Cancers are a major cause of death worldwide, accounting for over 8 million deaths per annum.[1] These figures are expected to increase: the World Health Organisation (WHO) estimates that, globally, the burden from cancer has more than doubled in the last three decades[2] with, due to the aging population, a projected increase of 50% in new cancer cases annually by 2020.[3] In the UK, incidence rates have increased by more than a third in a similar time period, with more than 330,000 people diagnosed annually.[4] One factor that can impact on patient survival is the time taken to reach a cancer diagnosis and implement treatment. Currently, in England, late diagnoses for breast, lung and colorectal cancer are believed to contribute toward increased mortality rates compared to other European countries.[5,6]

The UK National Institute for Health and Clinical Excellence (NICE) has introduced referral guidelines for suspected cancers by primary healthcare professionals with a view to improving survival rates.[7] The guidelines explain how and when patients presenting with symptoms suggestive of a malignancy should be referred to a specialist. These symptoms – the so-called alarm symptoms – include haematuria, haemoptysis, dysphagia and rectal bleeding and are indicative of cancer in patients presenting to General Practitioners (GPs) for routine appointments.[8,9] Since the introduction of these guidelines, there is evidence that diagnostic delays for some cancers have reduced.[9] Despite this and given that the projected numbers of cancer diagnoses are set to increase, initiatives to promote the early detection of cancer remain a priority. Indeed, particular challenges in the UK relate to cancer-related health inequalities.[10] That is, incidence rates of certain cancers are higher, and prognoses are poorer, for patients living in deprived areas, compared to more affluent

ones. For example, in Scotland the incidence of oesophageal cancer is 74% higher in deprived areas, compared to the least deprived.[11] Often, in deprived areas, healthcare access – a well-established social determinant of health – is lacking and is not sufficient to meet the needs of the population.[12]

One healthcare provider that may have a role in the early detection of cancer is the community pharmacist. This has been acknowledged by the UK Department of Health (DoH), through the '*Be Clear on Cancer*' campaign,[13] which used pharmacies to inform patients about the importance of seeing a GP, should they have an alarm symptom. Other smaller studies have investigated the potential for pharmacies to be involved in referral pathways for lung cancer and bowel cancer: both demonstrated that patients present at the pharmacy with symptoms indicative of each disease.[14,15] Estimates vary with regard to the reach of the community pharmacy network, but some sources suggest over 90% of the population makes at least one visit per year.[16,17] Evidence also suggests patients in the most deprived areas have the greatest access to pharmacies – the Positive Pharmacy Care Law[18] – irrespective of urbanity and that a range of patients – of varying age, gender and social class – visit pharmacies every month to collect prescriptions, purchase over-the-counter (OTC) medicine and obtain healthcare advice.[19] Community pharmacies, therefore, appear to be conveniently placed to deliver public health initiatives related to the early detection of cancer. One particular challenge around this proposal is that it is currently unknown what, if any, patients with alarm symptoms suggestive of cancer present at pharmacies.

Aim of the study

This study aimed to assess the frequency and mean of patient reported alarm symptoms across a representative range of community pharmacies in the North of the United Kingdom. We also aimed to explore the relationship between deprivation index of the pharmacies and average frequency of presentation per pharmacy per deprivation tertile. The study is the first to explore the frequency of alarm symptoms presenting at community pharmacies.

Ethical Approval

The study team was advised that ethical approval was not required, as the work was registered with each associated NHS Area Team as a clinical audit, which forms part of the requirements of the community pharmacy contractual framework. All patients included in the analysis gave their informed consent to take part in the study.

Methods

This was a prospective study conducted across 33 community pharmacies located throughout Northern England from September 2013 to February 2014. All of the pharmacies were part of the same independent group and offered a range of services commissioned under the NHS Community Pharmacy Contractual Framework for England,[20] including the sale of over-the-counter medication and the provision of related advice.

To ensure there was consistency between each pharmacy around knowledge of alarm symptoms,[7] all staff were provided with education and training lasting around 1 hour; this was administered by the superintendent pharmacist for the group and each individual

pharmacist provided further training to staff within each pharmacy. The core of the training focused on knowledge of alarm symptoms, but also considered communication skills, including how to question patients sensitively without causing unnecessary concern. During the study period, each pharmacy was provided with a list of criteria related as to what constitutes an alarm symptom to ensure parity in data collection (adapted from NICE guidance[7]). This information was periodically reinforced during the study period. The alarm symptoms that were recorded were:

- persistent cough lasting longer than 3 weeks;

- unexplained dyspepsia lasting longer than 3 weeks;

- haematuria;

- persistent diarrhoea or melaena;

- persistent emesis or haematemesis;

- rectal bleeding;

- dysphagia;

- unexplained weight loss, and

- lump or mass in the breast.

Patients seeking general advice or specific guidance for minor ailments or those requesting to purchase a medicine possibly related to an alarm symptom were questioned using the WWHAM question framework.[21] For each patient presenting with alarm symptoms the following data were recorded: alarm symptom(s) exhibited, gender, ethnicity, and the date and time presented. All patients presenting were given appropriate advice and verbally referred to their GP by the pharmacist for further investigation; patients were not followed up once referred.

The location of each pharmacy was mapped to the IMD 2010 deprivation index.[22] From this, a deprivation tertile for each pharmacy location was calculated. The term 'deprivation tertile' is used to group the population into three ordinal categories according to a particular level of deprivation. Thus, the least deprived tertile (1) equates to the least deprived 33.3% within a population, while the most deprived tertile (3) represents the 33.3% of a population living in the most deprived circumstances. In addition to deprivation calculations the location of each pharmacy was also classified according to the Rural and Urban Area Definition for Lower Layer Super Output Areas (LSOA), the pharmacies in this sample were all subsequently classified as being either within urban (population of area > 10,000 people) or town and fringe areas (part of a settlement where populations <10,000 people).[23]

Means, standard deviations, or percentages for outcomes were calculated, as appropriate using Microsoft Excel and IBM SPSS. The data were analysed using a Kruskal-Wallis test in order to determine whether there were any statistically significant associations between average frequency of alarm symptoms presented per pharmacy and the deprivation tertile.

Data was reported on a monthly basis from each pharmacy and results were collected consistently throughout the study period.

Results

During the study period, the total number of people who presented with alarm symptoms at the pharmacies was 642; more female (n=378, 58.9%) patients presented than males (n=264, 41.1%). The majority of those presenting with alarm symptoms were white (n=587,

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91.4%). Less than 10% were from ethnic minorities, which is comparable to the percentage

of ethnic minorities residing in the North of England.[24] Presenting ethnic minority groups

included mixed/multiple ethnic groups (n=24, 3.7%) and Asian/British Asian (n=20, 3.1%). A

total of 642 alarm symptoms were observed, no patient reported more than one alarm

symptom. The frequency of presentation for each alarm symptom is shown in Table 1.

Table 1. Frequency of alarm symptoms presented during the study period.

Alarm symptom	Frequency of presentation
Persistent cough lasting longer than 3 weeks	296 (46.10%)
Haematuria	49 (7.63%)
Persistent diarrhoea or melaena	59 (9.19%)
Unexplained dyspepsia lasting longer than 3 weeks	108 (16.82%)
Lump or mass in the breast	16 (2.49%)
Rectal bleeding	29 (4.51%)
Dysphagia	28 (4.36%)
Persistent emesis or haematemesis	32 (4.98%)
Unexplained weight loss	25 (3.89%)
Total	**642 (100%)**

When each pharmacy was stratified according to deprivation tertile, twenty-one were

located in high areas of deprivation (of which 18 were urban and 3 were town and fringe),

nine in medium areas of deprivation (of which 7 were urban and 2 were town and fringe)

and three in low areas of deprivation (of which 3 were urban). For pharmacies in areas of

high deprivation, the mean number of alarm symptoms reported over the six month period was 20.67 (SD=22.7), for medium areas of deprivation the mean was 17.44 (SD=5.0) and, for low areas of deprivation, the mean was 17.0 (SD=13.1). Table 2 shows the mean number of alarm symptoms presented per pharmacy per tertile of deprivation alongside the Kruskal-Wallis analysis for each alarm symptom. Kruskal-Wallis was used owing to the small sample size and the data not being normally distributed. There were no statistically significant relationshsips between average frequency of presentation of alarm symptoms and deprivation tertile.

Table 2. Mean and standard deviation of the number of alarm symptoms presented per pharmacy by deprivation tertile over the 6 month study period (with 1 being the least deprived and 3 being the most deprived), including Kruskal-Wallis analysis.

Alarm Symptom	Deprivation Tertile (IMD) 1 (n=3)	Deprivation Tertile (IMD) 2 (n=9)	Deprivation Tertile (IMD) 3 (n=21)	Kruskal Wallis H statistic (p-value)
Persistent cough lasting longer than 3 weeks	8.33 (SD 7.02)	6.78 (SD 2.77)	10.00 (SD 13.20)	0.463 (0.793)
Haematuria	1.33 (SD 0.58)	1.22 (SD 1.72)	1.62 (SD 3.04)	0.865 (0.649)
Persistent diarrhoea or melaena	1.00 (SD 1.73)	2.11 (SD 3.44)	1.76 (SD 2.34)	0.423 (0.809)
Unexplained dyspepsia for longer than 3 weeks	3.00 (SD 2.00)	3.44 (SD 3.43)	3.24 (SD 4.55)	0.867 (0.648)
Lump or mass in the breast	0.33 (SD 0.58)	0.67 (SD 0.87)	0.43 (SD 0.93)	1.002 (0.606)
Rectal bleeding	0	0.44 (SD 0.73)	1.19 (SD 1.66)	3.028 (0.220)
Dysphagia	3.00 (SD 5.20)	0.78 (SD 0.83)	0.57 (SD 1.43)	2.329 (0.312)
Persistent emesis or haematemesis	0	0.78 (SD 1.09)	1.19 (SD 3.30)	1.916 (0.384)

Unexplained weight loss	0	1.22 (SD 1.30)	0.67 (SD 1.20)	4.396 (0.111)
Mean all symptoms	17.00 (SD 13.11)	17.44 (SD 4.98)	20.67 (SD 22.68)	2.025 (0.363)

Discussion

This is the first study to assess the type and frequency of alarm symptoms presenting at community pharmacies over a wide geographical area, ranging from deprived to affluent neighbourhoods.

Our data show that patients with a range of alarm symptoms present at community pharmacies looking for either healthcare advice or to purchase over-the-counter medication to alleviate their symptoms. There was an observation that, on average, more alarm symptoms were presented at community pharmacies located in areas of high deprivation, compared to those in middle and low areas, although this was not statisitically significant. Irrespective of this, the results demonstrate that patients use community pharmacies across all deprivation tertiles for advice, and present a range of alarm symptoms, which could be indicative of malignant disease. Considering the specific challenges around cancer-related inequalities and that access to healthcare is a well established social determinant of health, our results demonstrate that community pharmacy networks could have a role in managing these patients by highlighting potential alarm symptoms. This is of particular importance when the reach of the community pharmacy network is considered.[18] Some studies have

already explored the possibility of using community pharmacies for the early detection of lung cancer[14] and bowel cancer.[15] These studies were, however, conducted over limited time periods and only explored one specific alarm symptom. Our work builds on these findings and shows that, over a six month period, a range of alarm symptoms associated with different cancers were presented at community pharmacies over a wide geographical area, ranging from deprived to affluent neighbourhoods. In terms of the wider literature related to early cancer detection, there have been several initiatives undertaken in a community pharmacy setting, which have either focused upon cancer screening or raising awareness of cancer prevention. For example, Potter and colleagues showed that community pharmacists can improve the screening rates for colorectal cancer by providing patients with home screening tests.[25] While Mayer and colleagues found that when community pharmacists were given an educational intervention around skin cancer, the level of counselling related to skin cancer prevention offered to patients significantly increased.[26] Recently, Purwani and colleagues, through the Community Pharmacies Referrals Project (CoPhaR), examined direct referral pathways to secondary care for patients with potential respiratory disease, including lung cancer.[27] Of note, this study followed 60 referrals made from community pharmacy, 55 of which were considered by secondary care to be appropriate. Whilst these studies demonstrate there is scope for community pharmacists to improve cancer detection, there has, to date, been no published work undertaken to explore whether such pathways can improve survival outcomes for patients with cancer.

There is evidence from the literature that patients who have advanced symptoms of disease present with alarm symptoms at a range of healthcare providers.[9,28] Our study shows that

patients with a wide range of alarm symptoms present at community pharmacies and therefore there are opportunities to identify possible malignancy within that group of patients. At present, in the UK, a normal referral pathway for a patient presenting at a community pharmacy with an alarm symptom is for the pharmacist to refer to a GP, who would then, if they felt it was appropriate according to NICE,[7] make a referral to a specialist; the referral should usually be within 2 weeks of the GP seeing the patient. This process is informal and is subject to delay; indeed, it is known that many patients, especially those from lower socio-economic groups, delay contacting their GP because of fear of time wasting or because they are too busy to make an appointment.[29] Thus, and given that many cancers are diagnosed at an advanced stage when curative treatment is not possible, optimising the referral pathway may impact on the time taken to reach a diagnosis and contribute to improved patient outcomes.

As nearly half of the patients who presented at a pharmacy had a persistent cough lasting longer than 3 weeks, a chest radiograph could be used to help determine if they had lung cancer (although diagnosis is based on cytology), which is, according to NICE, recommended in a patient experiencing these symptoms.[7] This is significant, as approximately 90% of patients with lung cancer are symptomatic at the time of diagnosis with the majority of patients having a cough.[30] Our findings are timely as, in England, survival rates of lung cancer are worse in comparison to other European countries. Furthermore, it has been estimated that if survival rates for lung cancer mirrored the best performing European countries, 1300 deaths could be avoided in England each year.[31] Indeed, one of the challenges around lung cancer survival is that around 70% of cases are diagnosed at an advanced stage, with 39% of them presenting as an emergency.[28] Due to these challenges

there should be an emphasis on developing strategies to help promote the earlier detection of cancer. One element of this, given that our data show patients present at pharmacies with alarm symptoms, would be to explore the referral procedures between pharmacies and GPs. In this regard, a qualitative study exploring the acceptability and challenges of opening up referral pathways from the perspective of patients, physicians and community pharmacists would therefore be valuable.

In terms of study limitations, we acknowledge that just because a patient has an alarm symptom does not necessarily mean they have cancer. Indeed, alarm symptoms can also be associated with undiagnosed long-term conditions (e.g. a persistent cough can be a sign of Chronic Obstructive Pulmonary Disease). As patients were not followed up after the initial presentation, it is not clear what proportion, if any, had cancer – or if cancer was confirmed how it was staged in comparison to patients initially presenting at a GP. We also acknowledge that while we assigned each pharmacy a deprivation tertile, we did not consider deprivation tertile of the presenting patient. In the majority of cases, we assume patients visit their local pharmacies, but it is possible that patients from one deprivation tertile use a pharmacy from another deprivation tertile. Equally, our results are partialy confounded in that more of the pharmacies in the sample were located in poorer areas increasing the likelihood of higher numbers of presentations in the more deprived areas. A larger study, specifically powered to detect differences in frequency of presentation between pharmacies located in different deprivation tertiles would be of benefit.

Conclusions

Patients with alarm symptoms frequently present at community pharmacies over a wide geographical area, ranging from deprived to affluent neighbourhoods. There is scope, therefore to examine how formal referral pathways – through community pharmacies – can be used to improve the early detection of cancer.

Conflicts of interest

None

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