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Intervention

PLUS - Pharmacy referral for Lung cancer Symptoms: a feasibility study to assess the role of pharmacists in lung cancer diagnosis compared to current pathways

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1. Introduction

Lung cancer (LC) is the leading cause of cancer mortality worldwide, with over 30,000 deaths per year. LC is a fundamental health problem in the UK, primarily due to the late stage at which patients are diagnosed. Although there have been major developments in surgery, radiotherapy and chemotherapy, there has been very little improvement in survival over the last 20 years, with over 85% of people dying within one year of diagnosis. This is due to patients being diagnosed at a late stage when the cancer has grown and spread meaning that the patient is no longer able to have treatment with curative intent. Research indicates that late diagnosis is largely due to delays in patients attending their GP with symptoms of LC, which is due to a lack of symptom awareness and reluctance to seek medical attention (Ellis & Vandermeer, 2011). In Wales, LC has a high incidence of 2,300 new cases per year and poor one-year survival rates of just 30%. Moreover, there are major inequalities in the incidence and mortality from LC by deprivation.

Welsh Government's Together for Health: Cancer Delivery Plan (2012) set out objectives to improve cancer outcomes through local initiatives, including increased symptom awareness and access to diagnostic tests. In addition the UK LC coalition emphasises the need to encourage earlier presentation and symptom recognition. 25 by 25 recommended local screening initiatives and promotes running awareness campaigns annually and the introduction of local campaigns at a Health Board level to raise awareness. National public awareness campaigns have been shown to increase the proportion of early stage LC at diagnosis leading to increased surgical resection rates; however campaign reach was generally limited to more affluent groups. With community pharmacists having readily available medical advice and access to many people in deprived areas, it is more likely for an individual to see their local pharmacists for common aliments than to see their doctor in the first instance. The role of pharmacists in the diagnosis and management of chromic diseases such as Type II diabetes mellitus and hypertension is well published. Within the context of LC, similar projects have been undertaken with good acceptance from patients.

The PLUS study will be carried out as an iterative process over 4 stages. This first phase will launch the referral pathway to secondary care in pharmacies for patients with symptoms of LC, such as a cough, shortness of breath and haemoptysis. We will assess referral rates and diagnosis of early LC. We will also interview patients and health care professionals to understand the feasibility and acceptability of the referral process.

1.1 Background

In Wales over 2,300 patients are diagnosed with LC each year, with only 20% diagnosed at an early stage when they are eligible for potentially curative treatment. Later stage at diagnosis can partly be explained by prolonged symptomatic presentation, where patients report an average of six months delay from symptom discovery to the initial appointment with their GP (Koyi et al., 2002). Previous research suggests reasons for this delay include patient concerns that they may be wasting the GP's time and uncertainties about what the GP might discover (Chatwin et al., 2015). Furthermore, lower awareness of LC symptoms and misattribution of symptoms to ageing, smoking habit, pre-

existing co-morbidity such as COPD or chest infections have also been found to prolong symptom presentation or disclosure of symptoms during a consultation with the GP (Chatwin et al., 2014; Birt et al., 2014; Corner et al., 2005; Hamilton et al., 2005; Walter et al., 2015). In a recent study exploring the Factors associated with late presentation of LC symptoms (FACT) carried out by Hywel Dda University Health Board, preliminary data supports these factors as well as suggesting that symptom perception (e.g. "I didn't feel any different") often leads to delay. Additionally, the FACT study found that perceiving symptoms as normal presented as a barrier to presentation as well as difficulties with access to appointments at primary care level.

Those at highest risk for LC – current and former smokers over the age of 40, living in deprived communities with lung co-morbidity such as Chronic Obstructive Pulmonary Disease (COPD) – tend to report the longest delays and are most likely to receive a diagnosis of LC in the later stages where a cure is less likely. Fear, fatalism and stigma surrounding LC may also deter earlier help-seeking, particularly among smokers and deprived groups (Quaife et al., 2015; McCutchan et al., 2015). The need to diagnose LC early and reduce socioeconomic inequalities in LC is a high priority for Welsh Government policy. Improving Outcomes: A Strategy for Cancer (2011) emphasises the need for improved access to diagnostic testing, and 25 by 25 recommends that within Wales, Health and Care Research Wales should fund a local screening initiative following the Be Clear on Lung Cancer Campaign. It promotes running awareness campaigns annually and the introduction of local campaigns at a Health Board level to raise cancer awareness. In addition, Together for Health recommends that introducing a flagship innovation pathway for lung cancer will lead to reduced inequality of care and improved treatment options.

The Be Clear on Cancer national TV and radio LC public awareness campaign was shown to increase the proportion of early stage LC at diagnosis, leading to increased surgical resection rates (Ironmonger et al, 2014). However, there was evidence to suggest campaign reach was limited to more affluent groups (Moffat et al, 2015). Within Hywel Dda University Health Board GP cluster areas with greater social deprivation have a higher incidence and a great proportion of late stage LC at presentation in comparison to affluent areas, highlighting the need for a more targeted and innovative approach to cancer awareness and methods of encouraging early detection of LC in deprived groups. Additionally, more than 90% of patients with LC are symptomatic at diagnosis, with a cough being the most common presenting symptom. Other symptoms of LC include fatigue, shortness of breath, chest pain, weight loss and haemoptysis. However, the low specificity of symptoms in the diagnosis of LC is problematic. For example, although common, a cough symptom has low predictive value (PPV) of 0.4%. Whilst haemoptysis has a higher PPV of 2.4-7.5%, haemoptysis only occurs in a minority of patients (Shin et al., 2014; Walter et al., 2013). PPVs of symptoms increase with factors associated with LC risk such as old age, smoking status and the presence of multiple or persistent symptoms (Hamilton et al., 2005; Hippisley-Cox et al., 2011). Targeting high risk, symptomatic individuals to undergo LC diagnostic testing may reduce the potential for over-diagnosis.

Based on preliminary data from the FACT study, patient recommendations to encourage lung cancer awareness through the use of pharmacies was clearly evident. Reports further suggest that patients had a desire to undergo scans if there was reason for concern. This study will therefore explore the feasibility of pharmacy referral for potential LC symptoms and evaluate patient and health professional views and experiences of the referral pathway. Increasing patient access to diagnostic testing through community pharmacies, thus by-passing primary care, has the potential to increase early diagnosis and subsequent patient outcomes. It is widely accepted that primary care is under enormous pressure with patients often waiting weeks to be able to see their doctor – a theme that was prominent among interviewees in the FACT study - therefore we anticipate that by using community pharmacies this will reduce or at least not increase the work load of primary care with the potential to increase diagnosis of LC at an earlier stage. This study will aim to refine the referral process and explore feasibility for pharmacists to refer patients with symptoms of possible LC for chest x-ray and to explore acceptability to patients and health care professionals.

2. Aims and Objectives:

The primary aim of this study is to promote and introduce pharmacy referrals for chest x-rays and determine acceptability and feasibility of the pathway. We will (1) assess referral rates and diagnosis/stage lung cancer; and (2) explore patients' and health professionals' views and experiences of the referral pathway, and their suggestions regarding a public awareness campaign to increase lung symptomatic presentation to pharmacies.

The study objectives are:

1. Monitor numbers suitable for referral/willingness to be referred for chest x-ray by the pharmacy and the subsequent lung cancer diagnosis rates.
2. Explore whether the PLUS approach is acceptable to patients and healthcare professionals and reasons for these perceptions.
3. Explore the perceived impact on pharmacy workload and radiology referrals.
4. Highlight patient and professional views and experiences of consulting the pharmacist with LC symptoms.

3. Methodology

3.1 Participants

Carmarthenshire has a population of 178,000 with 240 patients diagnosed with LC per annum. Of these diagnosed with LC, 59.4% (National Audit of Cancer Diagnosis in Primary Care, 2011) are referred from primary care while the remaining are incidental findings where the patients are likely to experience no symptoms. In line with NICE guidance, the pathway will target male and female adults over the age of 40 years who present with symptoms of LC such as a cough that lasts for three weeks or more, shortness of breath and haemoptysis.

3.2 Sampling and Study Design

PLUS is an observational study that uses purposive sampling to collect quantitative and qualitative data from patients in Llanelli. We have identified and approached pharmacies in the Llanelli Locality to participate in the study and we anticipate that each pharmacy will see approximately 1 patient a week between September 2018 and September 2019, equating to 228 patients. Quantitative data will be collected to assess the number of patients referred and willingness to be referred, as well as the number and outcome of chest x-rays. All participants will be asked to complete a questionnaire to assess demographic characteristics (e.g. age, socioeconomic group, smoking history), acceptability of the service, a symptom interval measure and social influences on symptom presentation.

A sample of participants that have been referred by their pharmacist for a chest x-ray (up to 20 or until data saturation, recruited purposively by age, gender and referring pharmacy) and healthcare professionals (up to 20 including pharmacy staff and GPs) will be recruited to interviews. Interviews will be used to explore the barriers/facilitators to seeking advice, acceptability of referral, and views on a community awareness campaign for attending a pharmacy with LC symptoms.

3.3 Inclusion Criteria

- Individuals over the age of 40, who are current or ex-smokers with a history of 10 or more smoking pack-years, and have 1 or more of the following:
    - Coughing up blood
    - High pitched audible wheeze
    - Neck vein engorgement/facial swelling

      <u>Any of the following persisting for three weeks or more</u>:
    - Cough
    - Chest and/or shoulder pain
    - Weight loss
    - Shortness of breath
    - Hoarse voice
    - Finger clubbing
    - Swollen nodes in the head or neck
- Provided written informed consent.
- Mental capacity to understand the evaluation process of the study including consent.

- WHO performance status 1-3.

3.4 Exclusion Criteria

- Unable or unwilling to provide written informed consent.
- Never smokers
- Aged under 40 years
- Patients who have a diagnosed cognitive impairment will be excluded from the evaluation/ follow up element of the study.
- WHO performance status 4.

3.5 Recruitment

Patients will be recruited on a voluntary basis on the above eligibility criteria and will be consented according to the ethical principles of non-coercion of participants, with all patients being treated fairly and equally with no impact on their clinical care or service provision. We will include pharmacies from Llanelli Locality in the study as we wish to target high-risk groups in areas of socioeconomic deprivation (WCIDU Lung Cancer in Wales report, 2015).

Patients and health professionals that have consented to be contacted by the researcher will be recruited on a voluntary basis over the telephone to take part in qualitative interviews to assess their views and experiences of the referral process.

3.6 Proposed Method of Data Collection

People who present to their pharmacy with symptoms of LC such as a cough for over three weeks, haemoptysis, and shortness of breath will be assessed by their local pharmacist and an eligibility form will be completed. Consent will be taken from the patient for a chest x-ray referral and to be contacted by the researcher to participate in a follow up evaluation of the service. During the consent process, participants will be given a patient information sheet (PIS) detailing key information about the study. Once participants have read and understood the PIS and have been given the opportunity to ask any questions, written informed consent will be received by the pharmacist. All participants will be given the opportunity to provide consent in a free manner, and will be advised of right to withdraw from the study at any time, without it affecting their medical care or legal rights. Those who smoke will also be offered contact details for Help me Quit, the central contact point for all smoking cessation services in Wales. The referral form will be sent to the respiratory consultant in Prince Philip Hospital Llanelli, who will request the chest x-ray. Once the chest x-ray results have been reviewed by the consultant a decision will be made based on the outcome of these findings. If the results indicate uncertainties of a suspected tumour, patients will be followed up in the Carmarthenshire Rapid Access Lung Cancer Clinic (RALC) in Prince Philip Hospital, Llanelli; alternatively if findings are not suggestive of LC, patients will be followed up by their GP.

A feedback questionnaire will given to all patients who are recruited to the study. The feedback questionnaire will assess acceptability of talking to the pharmacist about their lung symptoms, advice the pharmacist provided, what symptoms the patient had and how long they had the symptom before presentation to the pharmacist, who they spoke to about their symptoms prior to the pharmacist and socio-demographic data. Questionnaires will be given to patients directly after their consultation with the pharmacist. Patients will be asked to complete and return the questionnaire as soon as possible after the consultation. Freepost envelopes will be provided for patients to return their completed questionnaires.

Using semi-structured interviews, participating patients (up to 20 stratified by pharmacy) and healthcare professionals (up to 20 to include Pharmacists and GPs) will be provided with the opportunity to feedback on their views and experiences of the referral process, and the acceptability of receiving smoking cessation advice. Interviews will be carried out by the qualitative researcher, these willthese be conducted face-to-face or via telephone depending on participants preference. A semi-structured interview schedule will be used to ensure a degree of consistency across the interviews whilst still allowing for information to be elicited iteratively as interviews progress. Some flexibility will be built into the interview schedule to enable researchers to build on knowledge gained from each additional interview. Interviews will last approximately 40 minutes. They will be audio recorded and recording transcribed for analysis purposes. We will be offering patients a £20 voucher as a thank you for taking part in interviews.

Topics for discussion with patients will include:

- Factors that led to the patient seeking medical advice from the pharmacist for the symptoms they experienced.
- Acceptability of patient consulting their pharmacist
- Acceptability of receiving smoking cessation advice
- Acceptability and feasibility of a community awareness campaign, including format and content preferences

Topics for discussion with healthcare professionals will include:

- Barriers and facilitators to implementation in practice of the referral pathway.
- Perceived impact of the referral pathway on pharmacists, GP practice and secondary care referrals.
- Acceptability and feasibility of a community awareness campaign

3.8 Data analysis

Quantitative data will be analysed using SPSS V.22. Descriptive analyses will be performed on all patient demographic data, including age, gender, ethnicity, marital status, education and smoking history. The number of patients attending for a chest x-ray from those that are referred, and the number of those that are subsequently diagnosed as LC, will be reported as descriptive summary statistics. Clinical data such as tumour stage, histology, smoking status, co morbidities and medical history, as well as symptom variables will be described in percentages (frequencies), means and standard deviations. For categorical variables, only frequencies will be obtained.

Interview recordings will be transcribed verbatim and analysed using thematic analysis. A recursive technique to code identification will be used with deductive pre-set a priori codes (relating to themes identified in questions in the interview schedule) and an inductive exploration of emerging themes extrapolated from the data. Comparisons will be made between the stratification groups where appropriate. A sub-set of transcripts (20%) will be double-coded to assess consistency of codes, categories and theme identification.

Outcomes and dissemination

This study provides a real world and grounded analysis of the potential impact of pharmacy referral on LC diagnosis. It is hoped that this work will provide a pathway that is acceptable to the public, which can be taken forward. If the pathway is found to be feasible and acceptable, a community awareness intervention campaign will be developed and implemented. This campaign and pathway can then be formally trialled to assess patient outcomes and cost effectiveness. This trial will assess the effect of the intervention and pathway on patient diagnosis staging, patient outcomes, prognosis and economic evaluation. During this phase a pharmacy-training plan will be developed that can be delivered to pharmacists and other pharmacy staff in later phases.

The following study outcomes will be recorded:

- Number of people that attended this service and their feedback/experience of process
- Acceptability of the referral pathway to the public and health professionals
- The number of patients diagnosed with LC and other respiratory conditions through the project and stage at presentation
- Numbers of patients diagnosed in the whole cluster and stage at presentation, resection rate and radical treatment rates

It is anticipated that this stage of the PLUS study will confirm the feasibility and acceptability of the pharmacy pathway. If appropriate it is hoped that future iterations of this study will help raise awareness of LC symptoms and improve access to diagnostic testing. This will lead to an increase in those diagnosed at an earlier stage, and an increase in numbers receiving curative treatment and improved survival for those with LC. It will also allow us to target lower socioeconomic groups and thus bridge the gap between richest and poorest. By increasing awareness of LC symptoms and risk factors, those with symptoms will be promoted to consult a healthcare professional. With evidence showing that this cohort is more likely to consult their pharmacy with aliments in the first instance, this study has the potential to promote early diagnosis.

The results of this study will be presented at the European Respiratory Society in 2018 and 2019 and at the American Thoracic Society in 2019. We will also present this work at the Welsh Thoracic Society and the British Thoracic Society summer and winter meetings as appropriate. We will also look to present at the Wales cancer Partnership annual meeting and will attend the Royal Pharmaceutical annual conference in 2019. Furthermore, the findings will be submitted to the British Medical Journal for publication and findings will be disseminated on the study website and through social media to ensure the public is aware of the impact.

4. *Public and patient involvement plans*

The development of this study has resulted from feedback of patients with LC in a research development meeting and has been discussed with patients attended the LC survivorship group who have offered support and highlighted the benefit of this proposed service. To ensure that patients continue to be involved in the design of the study, we have formed an advisory/steering group, with two patient representatives. They will be essential to the development and conduct of the study. We will have a maximum of six study steering group meetings. This study has been designed to explicitly engage patients and the public in implementation and evaluation. Results will explore and highlight patient views and experiences and ensure that these are taken in to consideration when taking the research forward.

5. *References*

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