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Introduction of a referral pathway guide for general dental practitioners in Cheshire & Merseyside: the effect on two-week suspected cancer referrals

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Key points

The incidence of oral cancer is increasing and it is well established that early detection and treatment is associated with improved survival. Cheshire and Merseyside Local Dental Network introduced a new Oral Cancer Care Guide in 2017, which emphasises the important role of the dental team in the early detection of oral cancer and streamlines the two-week-wait (TWW) referral pathway. Our results provide more information about two-week-wait oral cancer referrals to our unit following the introduction of local guide and show an increase the number of referrals from GDPs but, as the rate of cancer did not change, the cancer conversion rate was less.

Abstract

Introduction In 2017, Cheshire and Merseyside Local Dental Network introduced an Oral Cancer Care Guide for dental teams, emphasising the importance of early detection, appropriate referral, and effective patient communication. This study looks at the effect on two-week-wait (TWW) referrals to one unit, following the introduction of the guide and regional educational intervention.

Methods Somerset Cancer Register, provided data from two three-month cohorts of TWW suspected head and neck cancer referrals, before and after introduction of the guide.

Results There were 390 and 481 referrals respectively during the two three-month time-periods. The number of general dental practitioner (GDP) referrals rose from 24 to 59 (6.2% to 12.3%, P = 0.002) following introduction of the guide. The cancer conversion rate remained the same for general practitioner (GP) referrals (6.3% and 6.2%) but was lower for GDP referrals (21% vs 12%, P = 0.31).

Conclusions We observed an increase in referrals following the introduction of the guide; however, the conversion rate for GDP referrals reduced. Education and ease of referral are essential for reducing the number of advanced cancers presenting to secondary care, but more research is required to inform an improvement in specificity. Future work is required looking at the long-term impact of the guide including adaption for local GP usage.

Introduction

The two-week-wait (TWW) referral pathway for suspected cancer was introduced in the year 2000 as part of the Department of Health NHS Cancer Plan.¹ It was recognised that patients were often facing unacceptable waiting

Refereed Paper. Accepted 22 July 2019 https://doi.org/10.1038/s41415-019-1003-2 times when presenting with early symptoms of cancer, hence a pathway was implemented which optimised the patient journey by reducing the time between initial presentation, specialist review and initiation of treatment. The streamlining of suspected cancer referrals is of particular importance in oral cancer, where early detection and treatment is associated with improved survival.² This is further underlined by the increasing incidence of oral cancer, where rates are projected to rise by 33% in the UK between 2014 and 2035.³ There is also a shifting demographic with increasing incidence in younger patients.

Generally, the initial recognition and referral of suspected cancer patients lies in the domain of the general medical practitioner (GP), hence GPs are familiar with local pathways for patient referral. In the case of oral cancer, however, general dental practitioners (GDPs) are often better placed

to pick up the early signs of disease and have been shown to perform favourably compared to their GP counterparts when it comes to the early diagnosis of oral cancer.4,5,6 Cheshire and Merseyside Local Dental Network introduced a new Oral Cancer Care Guide in 2017,7 which emphasises the important role of the dental team in the early detection of oral cancer and streamlines the TWW referral pathway for the dental practices. This guide aims to improve oral cancer survival rates in Cheshire and Merseyside by raising the dental team's awareness of the signs, symptoms and risk factors associated with oral cancer and ensuring good practice when making TWW referrals. It also provides good practice guidance on communication skills when engaging in oral cancer consultations.

This study aims to look at the impact of the new Oral Cancer Care Guide on TWW referrals to our head and neck surgical unit.

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Patient and methods

Intervention – the new Oral Cancer Care Guide

Cheshire and Merseyside Local Dental Network, in collaboration with key stakeholders, produced a new Oral Cancer Care Guide in October 2017.7 This initiative, supported by NHS England, placed emphasis on the local system embracing evidence-based national key drivers^{8,9} for the early detection of oral cancer symptoms, and improving quality of suspected oral cancer referrals to secondary care via the TWW process. The guide also raised awareness of preventive strategies with regards to oral cancer, emphasising that almost half of oral cancers are linked to lifestyle factors¹⁰ thus highlighting the practice of brief intervention, including signposting to local smoking cessation and alcohol support services. All dental practices (n = 360) in the Cheshire and Merseyside area received paper copies of the guide as well as access to the guide in an electronic format. The guide was launched at two oral cancer education study events, following which Health Education England North West supported local dental practice peer review meetings to further raise awareness of the guide contents and discuss issue relevant to primary care practices. Ninety dental practices were involved in these meetings including local clinicians from the head and neck cancer unit, Public Health England, Cancer Research UK and dental practice champions, who facilitated the sessions.

Data

All data was requested via the Somerset Cancer Register and collected by Aintree University Hospital Trust as part of the TWW cancer tracking. Data was provided in spreadsheet format. The sample comprised of two threemonth cohorts of TWW suspected head and neck cancer (HNC) referrals, with date of receipt of referral between 3 July and 29 September 2017 for the pre-guide cohort and 1 February to 30 April 2018 for the post-guide cohort. In addition to the computerised record, some manual extraction of information was required for date of birth (for age), and (for those seen by the GDP) for symptoms, investigations (X-ray, biopsy) and clinical diagnosis. Fishers exact test was used to compare the two time cohorts in regard to categorical variables, such as conversion, and the Mann-Whitney test in regard to numerical variables, such as delay in days from date of decision to refer to date

of first appointment with specialist. Statistical significance was taken as p <0.05.

Audit approval

Aintree University Hospital Clinical Audit Department approved this study.

Results

There were 390 and 481 referrals respectively during the two three-month time-periods. The number of GDP referrals rose from 24 to 59, the percentage doubling from 6.2% to 12.3%

Table 1 Comparison of the two 3-month cohorts in respect of patient, clinical and temporal characteristics								
		July–Sept 2017		Feb–April 2018		P-value**		
Total referrals	ALL	390	-	481	-	0.002		
	GDP	24	6.2%	59	12.3%			
	GP	366	93.8%	422	87.7%			
Conversion rate	ALL	28/389	7.2%	33/481	6.9%	0.89		
	GDP	5/24	20.8%	7/59	11.9%	0.31		
	GP	23/365	6.3%	26/422	6.2%	>0.99		
Female gender	ALL	233/390	59.7%	286/481	59.5%	0.95		
	GDP	13/24	54.2%	32/59	54.2%	>0.99		
	GP	220/366	60.1%	254/422	60.2%	>0.99		
Median (IQR) age (at decision to refer)	ALL	58 (46–71)	N = 390	57 (45–69)	N = 871	0.37		
	GDP	66 (50–72)	N = 24	58 (48–70)	N = 59	0.33		
	GP	58 (45–71)	N = 366	57(45–69)	N = 422	0.46		
MFU specialty	ALL	99/390	25.4%	139/473	29.4%	0.19		
	GDP	23/24	95.8%	57/59	96.6%	>0.99		
	GP	76/366	20.8%	82/414	19.8%	0.79		
Median (IQR) delay* days	ALL	9 (7–13)	N = 388	12 (9–14)	N = 459	<0.001		
	GDP	7 (6–13)	N = 24	12 (8–14)	N = 59	0.04		
	GP	9 (7–13)	N = 364	12 (9–14)	N = 400	<0.001		
Delay >14 days*	ALL	42/388	10.8%	94/459	20.5%	<0.001		
	GDP	2/24	8.3%	13/59	22.0%	0.21		
	GP	40/364	11.0%	81/400	20.3%	<0.001		
Method of referral-ALL	eReferral	68/390	17.4%	143/481	29.7%	<0.001		
	Fax	113/390	29.0%	271/481	56.3%			
	Letter	174/390	44.6%	29/481	6.0%			
	Not known	35/390	9.0%	38/481	7.9%			
Method of referral-GDP	eReferral	-	-	4/59	6.8%	<0.001		
	Fax	6/24	25.0%	38/59	64.4%			
	Letter	16/24	66.7%	11/59	18.6%			
	Not known	2/24	8.3%	6/59	10.2%			
Method of referral-GP	eReferral	68/366	18.6%	139/422	32.9%	<0.001		
	Fax	107/366	29.2%	233/422	55.2%			
	Letter	158/366	43.2%	18/422	4.3%			
	Not known	33/366	9.0%	32/422	7.6%			
*From date of decision	to refer to date	of first appointmer	t with specialist. *	*Fishers exact test				

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(P = 0.002, Table 1). The cancer conversion rate remained the same for GP referrals (6.3% and 6.2%) but was lower for GDP referrals (21% vs 12%, P = 0.31). The delay from the date of decision to refer to the date of a first specialist appointment increased overall by about 3 days on average (P <0.001), with increased delays observed for both GP and GDP referrals. In particular, delays of more than 14 days nearly doubled from 11% to 21% overall, with similar results seen for GP and GDP referrals. There was also a significant shift in the mode of communicating referral, with letters in decline and more use being made of fax and electronic referral by both GPs and GDPs.

For those referred by GDPs, Table 2 provides a summary of symptoms, investigations and outcomes for each of the two cohorts. 'Ulcers' were a common referring symptom for both cohorts (29.2% and 30.5% respectively). There was a drop in the proportion of 'lesions' referred (41.7% and 10.2%), however there was a considerable increase in 'mass/swelling/ lump' referrals (0% and 27.1%). No further investigation was required in 45.8% and 34.0%, with a clinical diagnosis made during the first consultation. Many were immediately discharged with no further follow up (50% and 28.8%). For those requiring further investigation, the majority underwent biopsy alone (33.3% and 30.5%) with some undergoing scans (including both MRI and CT) in addition to biopsy (16.7% and 13.6%).

Discussion

GDPs have an important role in the early detection of oral cancer. This study looks at the effect of a local Oral Cancer Care guide on TWW referrals to our HNC unit. The early detection and treatment of oral cancer is paramount to improving outcomes and the significance of this should be emphasised in the context of increasing incidence and a shifting demographic to a younger population. The Oral Cancer Care Guide introduced to Cheshire and Merseyside emphasises the importance of primary care dental practitioners in the early diagnosis and referral of suspected oral cancer patients, providing a toolkit to optimise the TWW process. The purpose of this study was to look at impact of the guide on referrals to our unit, in particular noting the number of referrals, the proportion of these made by a GDP (versus a GP) and the outcome of these referrals. There are limitations to this study, including the fact that it is a single centre study

with relatively small numbers. The pre- and post-intervention cohorts only reflect a timespecific snapshot and may not be representative of referral patterns over a larger period of time or, indeed, initial referral patterns to the satellite district general units in Cheshire and Merseyside. Additionally, our two cohorts were taken from different months, a factor which may contribute to the variation in referral numbers. It should also be noted that the catchment of our unit includes a high proportion of low socioeconomic status areas, a factor strongly associated with oral cancer, which may further skew results.¹¹ Furthermore, it is not possible to determine whether any changes in referral patterns are truly a result of the new guide being introduced.

Our results demonstrate a high number of GP referrals versus GDP referrals, an observation that may not be representative of other units, and may relate to the low socioeconomic status of our catchment area. There is evidence that patients from more deprived neighbourhoods are less likely to be referred by a GDP11 perhaps due to lower GDP registration rate.12 Perceived ideas related to cost and access to NHS dental care may be the driving factor here. Whilst GP referrals make up an overwhelming majority, GDP referrals still contribute a significant number, demonstrating a higher conversion rate (that is, positive predictive value) than their GP counterparts. This is consistent with previous studies demonstrating favourable performance

Table 2 Summary of presenting symptoms, investigations performed and outcomes from the two 3-month cohorts of GDP referrals

	July–Sept 2017 (n = 24)	Feb–April 2018 (n = 59)				
Presenting symptom						
Ulcer	7 (29.2%)	18 (30.5%)				
Lesion	10 (41.7%)	6 (10.2%)				
Mass/swelling/lump	0	16 (27.1%)				
White patch	3 (12.5%)	10 (17.0%)				
Other	4 (16.7%)	7 (11.9%)				
Not certain	0	2 (3.4%)				
Investigations performed						
Biopsy and scans	4 (16.7%)	8 (13.6%)				
Biopsy only	8 (33.3%)	18 (30.5%)				
None- clinical diagnosis	11 (45.8%)	20 (34.0%)				
OPG only	1 (4.2%)	3 (5.1%)				
Did not attend	0	4 (6.8%)				
Barium swallow	0	1 (1.7%)				
Ultrasound only	0	2 (3.4%)				
Scans only	0	2 (3.4%)				
Examination under anaesthetic	0	1 (1.7%)				
Diagnosis/outcome						
Discharged	12 (50%)	17 (28.8%)				
Cancer	5 (20.8%)	7 (11.7%)				
Frictional keratosis	3 (12.5%)	3 (5.1%)				
Lichen planus/lichenoid reaction	1 (4.2%)	3 (5.1%)				
Non-specific ulceration/traumatic ulcer	0	4 (6.8%)				
Kept under review	0	8 (13.6%)				
Other benign diagnosis	3 (12.5%)	16 (27.1%)				
Uncertain	0	1 (1.7%)				

by GDPs versus GPs when it comes to the early detection of oral cancer.^{4,5,6}

In addition to oral cancer, GDPs are also well placed to pick up oropharyngeal cancer during their examinations and this is highlighted in the guide, which describes looking for signs such as unilateral tonsillar enlargement, oropharyngeal mucosal abnormalities and cervical lymphadenopathy. This is of particular importance with a rising prevalence of oropharyngeal cancer and the implication of human papilloma virus (HPV).13 Our GP conversion rates were in keeping with work done by Langton et al.,14 whose meta-analysis of 17 studies demonstrated an overall pooled conversion rate of 8.8%; however, our GDP conversion rates were much higher at 21% and 12% for the two cohorts. We also noted a significant increase in the number of GDP referrals following the introduction of the Oral Cancer Care guide, although it should be noted that GP referral numbers were also higher in our second cohort. This rise may reflect increased oral cancer awareness associated with the new initiative, in particular heightened awareness of oral cancer, and likely explains the reduction in conversion rate, where an unchanged oral cancer rate combined with an increase in referral numbers resulted in a lower percentage of true positives. Furthermore, the observed increase in delays was likely due to an increase in referral numbers putting pressure on outpatient services.

If these findings are hypothetically applied to a unit who receive a higher proportion of GDP referrals than us, the pressure on the system may be even more significant. With increased awareness of oral cancer surrounding the launch of the new guide, we did anticipate a slight increase in the number of referrals from GDPs, however the magnitude of this increase was somewhat unexpected. The system was not primed for such an increase in referrals, resulting in an increase in delays. If such patterns continued, adaptations would have to occur to ensure that we are able to see all referrals within two weeks, in keeping with national standards. In addition to increased awareness, it is hoped that a more streamlined pathway will make it more straightforward for GDPs to make TWW referrals. There was also a significant shift in the mode of communicating referral, with fewer letters and more use being made of fax and electronic referral by both GPs and GDPs.

The electronic referral system for GDPs is part of the new pathway and therefore there were no electronic referrals in the first cohort, and just a small number in the second cohort. It was envisaged that an increase in the proportion of electronic referrals should be observed as the pathway became more established. On 1 August 2018, all dentists were informed by NHS England that patients who had a suspicious lesion were to be referred using e-referral system only. Not only does this make the referral more consistent and straightforward for GDPs, but it also provides an audit trail, whereas currently it is difficult to know how many referrals get lost or delayed when sent by post or fax. This will bring the GDP referral system into line with electronic TWW referrals made by GPs.

Further analysis of GDP referrals revealed significant variation across the two cohorts. The number of patients receiving a clinical diagnosis at the initial consultation, without further investigation, was consistently high in both cohorts. This suggests demand on NHS resources in terms of clinic time and, potentially, patient anxiety where patients are referred for reassurance rather than significant clinical suspicion of HNC. There may also be an element of 'defensive referring' in the context of increasing GDC fitness-to-practise cases linked to delayed diagnosis of oral cancer.15 It is envisaged that the educational components of the Oral Cancer Care guide will improve confidence in this regard.¹⁶ There may also be real-world practical issues faced by GDPs in when it comes to screening patients for oral cancer in a primary care setting.17

Whilst there was a propensity for immediate discharge in the first cohort, there was an increased trend towards keeping patients under review in the second cohort. The significance of this is unclear. There were also observed differences in referring symptoms. Whilst the percentage of 'lesions' was higher in the first cohort, there were considerably more 'mass/swelling/lump' symptoms referred in the second cohort. It may be that there was increased awareness of masses and lumps following implementation of the new guide. 'Lesion' is a non-specific term and may, in fact, cover masses and lumps in the vocabulary of many clinicians. The change may therefore indicate shifting terminology of referring GDPs, a factor that may or may not be due to the educational components of the new guide. A reduction in the term 'lesion' is seen by many to be a positive change where a shift to more descriptive terms is likely to be more accurate¹⁸ and will likely improve the quality of the referral. The same thought process could

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apply to the use of the term 'mouth cancer' rather than 'oral cancer', where the former is thought to be a more descriptive and inclusive terminology, that also resonates more with the general public.¹⁸ The percentage of 'ulcers' was constant across the two cohorts with approximately one third of patients presenting with this symptom, as was the percentage of patients presenting with 'white patches'.

The results of our study give us more information about TWW referrals to our local oral and maxillofacial surgery department following the introduction of a new Oral Cancer Care Guide, however the true test of this guide will be how referral patterns change in the long term. It will be interesting to note whether GDPs will continue to provide a higher proportion of referrals and whether their conversion rate will remain high when a further audit cycle is completed. It may be beneficial to complete a future audit cycle over a longer period of time, thus increasing patient numbers and hopefully providing a more robust sample for analysis. It is anticipated that the standardisation of electronic referrals will improve the referral experience for GDPs and hopefully prevent any delays in referral to secondary care. It is vital that feedback is sought from local GDPs to hear their views on the new pathway, but also to improve our understanding of how the number of noncancer cases referred via the TWW pathway can be reduced. In addition to supporting the knowledge of GDPs and streamlining the referral process, the guide also serves to raise awareness of preventive strategies with regards to oral cancer. Assessing the impact of this is outside the scope of this audit; however, further work would be warranted which looks at how this impacts health promotion in community dentistry and whether it leads to the prevention or earlier diagnosis of oral cancer.

The local Oral Cancer Care Guide was used as a driver for other interventions to improve awareness about oral cancer, targeting both the general public and health professionals. For example, Mouth Cancer Awareness Week is an annual health campaign that was first introduced in 2001, and provides an opportunity to increase mouth cancer awareness through various mediums such as drop-in outpatient clinics, open invitation talks and even awareness stands at local shopping centres.¹⁹ Patient education is a key aspect in the early diagnosis of mouth cancer in terms of encouraging early presentation to primary care. There is evidence that male gender and non-healing mouth ulcers are

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associated with a delayed presentation, whilst red and white patches in the mouth may lead to earlier presentation to primary care.²⁰ In addition to improving knowledge amongst GDPs and GPs, work has also been done to promote awareness in community pharmacies, where patients sometimes present for health advice, particularly when they are unable get an appointment with their GP or GDP. This has become more common with the introduction of 'Care at the Chemist' schemes, where pharmacies have been commissioned to provide support and advice about specific health conditions.²¹ Further work may also be warranted which looks at how the guide impacted on local referrals, including those to lifestyle services such as smoking cessation, and whether it leads to the prevention or earlier diagnosis of oral cancer.

From a GP perspective, there may be scope to adapt the educational components of the guide to improve GP confidence surrounding the diagnosis of oral cancer and to observe whether this has any impact on the GP referral conversion rate. There may also be benefits to improving ties between GPs and GDPs, whereby GPs could refer to their GDP colleagues for same-day assessment where uncertainty exists around the potential diagnosis of oral cancer. This would serve to relieve some of the demands on secondary care and reduce the likelihood of unnecessary referrals. Ultimately, both prevention and the early detection and treatment of oral cancer are key to improving survival and ongoing efforts should be made to improve the knowledge and awareness of primary care health professionals and patients alike.

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