

Main Article

Ms J Montgomery takes responsibility for the integrity of the content of the paper

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Abstract

Objective. The coronavirus disease 2019 pandemic has greatly disrupted head and neck cancer services in the West of Scotland. This study aimed to assess the impact of the first wave of the pandemic on cancer waiting times.

Methods. A retrospective review of multidisciplinary team records was undertaken between March and May in 2019 and the same months in 2020. Time-to-diagnosis and time-to-treatment for new cancers treated with curative intent were compared between the study periods, and subclassified by referral pathway.

Results. A total of 236 new cancer patients were included. During the pandemic, pathways benefitted from reduced diagnostic and treatment times resulting from the restructuring of service provisions. A 75 per cent reduction in secondary care referrals and a 33 per cent increase in urgent suspicion of cancer referrals were observed in 2020.

Conclusion. Head and neck cancer pathway times did not suffer because of the coronavirus pandemic. Innovations introduced to mitigate issues brought about by coronavirus benefitted patients, led to a more streamlined service, and improved diagnostic and treatment target compliance.

Introduction

Head and neck cancer is the eighth most common cancer in the UK.¹ Referrals to the head and neck service with an urgent suspicion of cancer are expedited to minimise delays to diagnosis and time-to-treatment. It is widely accepted that increased time-to-diagnosis and time-to-treatment are associated with poorer clinical outcomes, including increased mortality associated with the rapidly progressive nature of head and neck malignancy.²

The National Institute for Health and Care Excellence mandates that urgent suspicion of cancer referrals should be seen within two weeks of the referral being made.³ A diagnosis should be achieved within 31 days of referral, and treatment should be commenced within a maximum of 62 days. Despite efforts to meet these targets, it is not always possible because of difficulties that arise from: the increasingly high volume of urgent suspicion of cancer referrals, the limited availability of radiological services for cross-sectional imaging and ultrasound-guided tissue biopsies, and the limited opportunities to perform staging examinations under local or general anaesthesia.⁴

Urgent suspicion of cancer referrals are indicated by the presence of 'red flag' features of head and neck cancer, particularly in combination with known aetiological risk factors such as smoking or excessive alcohol intake.⁵ The urgent suspicion of cancer pathway facilitates early access to specialist services, with the aim of optimising outcomes by diagnosing malignancy at an earlier stage. Prior to the coronavirus disease 2019 (Covid-19) outbreak, once a patient was referred, they would attend clinic, have a full history taken, and undergo complete examination including flexible laryngoscopy of the upper aerodigestive tract. Further investigation and management would be organised where indicated.

The delivery of routine National Health Service (NHS) care was hugely disrupted because of the rapid spread of Covid-19 and the burden of disease caused by the pandemic. The first UK national lockdown began on 23 March 2020, which led to the cancellation of most ENT clinic appointments. Many secondary care sites, including our own in NHS Greater Glasgow and Clyde, began to offer telephone appointments to determine the necessity of a face-to-face review. A telephone template was developed locally for red flag symptoms. Shortly afterwards, ENT UK promoted the use of a risk calculator to facilitate remote triaging.⁶

The assessment of patients referred via the urgent suspicion of cancer pathway was made more difficult by the classification of flexible laryngoscopy as an aerosol-generating procedure (AGP). This necessitated use of the highest level of personal protective equipment (PPE).⁷ Some health boards stipulated the need for 'down-time' of the clinic room before another patient could be brought in, to allow a prerequisite number of air changes to occur in order to prevent aerosol exposure. In NHS Greater Glasgow and Clyde, the required

Table 1. Inclusion and exclusion criteria applied to head and neck cancer referrals

Inclusion criteria
– West of Scotland MDT meeting outcome sheet available on electronic health records
– Confirmed head & neck malignancy
– Underwent treatment with curative intent
– Treated in West of Scotland
– Age \geq 16 years
Exclusion criteria
– Diagnosed with benign disease
– Non-head & neck cancer
– Palliative treatment or declined curative treatment
– Recurrence of previously diagnosed disease
– Died prior to beginning treatment
– Incomplete documentation on electronic health record

MDT = multidisciplinary team

down-time was 2 hours, which impacted the number of new face-to-face appointments that could be achieved per clinic.^{8–10}

This audit aimed to compare head and neck cancer referral pathway times in the West of Scotland during the first wave of the Covid-19 pandemic with those during the same time period in 2019.¹¹

Materials and methods

We conducted a retrospective review of head and neck multidisciplinary team (MDT) data from the start of March to the end of May in both 2019 and 2020. A total of 207 patients were discussed at MDT meetings during the study period in 2019, while 185 patients were discussed over the same time period in 2020. Information on these patients was anonymously compiled from electronic health records. Demographic data on gender, age, disease stage and referral route were collected.

Only patients diagnosed with a true, *de novo* head and neck cancer, who received treatment with curative intent, were considered for inclusion. Inclusion and exclusion criteria are fully detailed in Table 1. After application of these criteria, 118 patients in 2019 and 118 patients in 2020 were considered suitable for analysis.

Pathway times with respect to the 31-day and 62-day targets were calculated for each referral pathway: urgent suspicion of cancer, urgent out-patient, routine out-patient, secondary care and emergency presentations. The numbers of patients who met the 31-day time-to-diagnosis and 62-day time-to-treatment targets were compared.

This audit was agreed by our clinical governance department. All data were stored with consideration to Caldicott Guardian principals. Ethical approval was not required in our institution as this is an audit of clinical practice.

Results

Demographics

In 2019, 80 (67 per cent) of the 118 patients were male and the mean age was 63.7 years. The most common stage of disease presentation was stage 4.

Table 2. Head and neck cancer patient demographics in 2019 and 2020

Characteristics	2019	2020
Patients (<i>n</i>)	118	118
Age (mean \pm SD; years)	63.7 \pm 10.8	61.5 \pm 10.0
Gender (<i>n</i> (%))		
– Male	80 (68)	91 (77)
– Female	38 (32)	27 (23)
UICC staging (<i>n</i> (%))		
– Stage 1	27 (22.9)	24 (20.3)
– Stage 2	13 (11.0)	16 (13.6)
– Stage 3	30 (25.4)	37 (31.4)
– Stage 4	48 (40.7)	41 (33.9)
Referrals (<i>n</i> (%))		
– Urgent suspicion of cancer	57 (48.3)	76 (64.4)
– Urgent	19 (16.1)	16 (13.6)
– Routine	8 (6.8)	12 (10.2)
– Secondary care	28 (23.7)	7 (5.9)
– Emergency presentation	6 (5.1)	7 (5.9)
Patients meeting 31-day diagnostic target (<i>n</i> (%))	40 (33.9)	50 (42.4)
Patients meeting 62-day treatment target (<i>n</i> (%))	31 (26.3)	34 (28.8)

SD = standard deviation; UICC = Union for International Cancer Control

In 2020, 91 (77 per cent) of the 118 patients were male and the mean age was 61.5 years. The most common stage of disease presentation was stage 4, as highlighted in Table 2.

Urgent suspicion of cancer pathway

Most patients referred with head and neck cancer were referred through the urgent suspicion of cancer pathway. This remained consistent between the study periods, with 57 patients (48.3 per cent) in 2019 and 76 patients (64.4 per cent) in 2020. There was a 33.3 per cent statistically significant ($p = 0.013$) increase in cancers in urgent suspicion of cancer referrals during the first wave of the Covid-19 pandemic in 2020, as illustrated in Figure 1.

In 2019, 19 patients (33.3 per cent) met the 31-day time-to-diagnosis target, and 17 patients (29.8 per cent) achieved the 62-day time-to-treatment target. In 2020, 37 patients (48.7 per cent) were diagnosed within 31 days, and 24 (31.6 per cent) began treatment within 62 days, as shown in Figure 2. No significant difference was found using chi-square tests for time-to-diagnosis ($p = 0.076$) or time-to-treatment ($p = 0.828$) between the study periods.

Urgent out-patient referral pathway

Nineteen patients (16.1 per cent) were referred as an urgent out-patient in 2019, compared with 16 patients (13.6 per cent) in 2020. In 2019, four patients (21.1 per cent) met the 31-day time-to-diagnosis target and one patient (5.3 per cent) met the 62-day time-to-treatment target. In 2020, four patients (25.0 per cent) met the 31-day time-to-diagnosis target and four patients (25.0 per cent) met the 62-day time-to-treatment target. Using Fisher's exact test, no

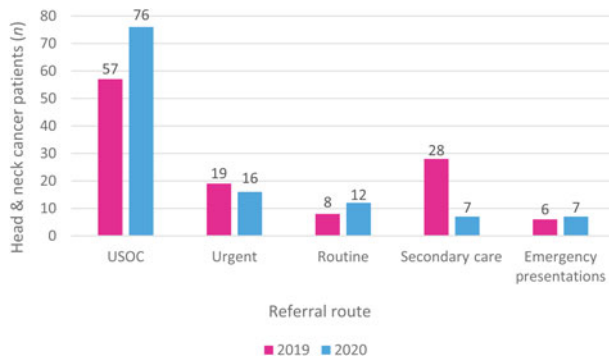


Fig. 1. West of Scotland head and neck cancer patients split by referral route during March–May 2019 and March–May 2020. USOC = urgent suspicion of cancer

significant difference was found in time-to-diagnosis ($p = 1$) or time-to-treatment ($p = 0.156$) between the study periods.

Routine out-patient referral pathway

In the routine out-patient referral cohort, only 1 of the 8 patients (12.5 per cent) in 2019 met the 31-day time-to-diagnosis target, compared to only 1 of the 12 patients (8.3 per cent) in 2020. There was no significant difference ($p = 1$) using Fisher's exact test. In 2019, one patient (12.5 per cent) met the 62-day time-to-treatment target, while in 2020, zero patients (0 per cent) met the target. Again, no significant difference was identified ($p = 0.4$) using Fisher's exact test.

Referrals from secondary care specialties

In 2019, 28 patients with head and neck cancer were referred from secondary care, and 11 patients (39.3 per cent) met the 31-day time-to-diagnosis target. In 2020, seven patients with head and neck cancer were referred from secondary care, and two patients (28.6 per cent) met the time-to-diagnosis target, with no significant difference found ($p = 0.689$, Fisher's exact test). The 62-day time-to-treatment target was met by nine patients (32.1 per cent) in 2019, compared to one patient (14.3 per cent) in 2020, with no significant difference found ($p = 0.645$, Fisher's exact test). Table 2 shows a statistically significant ($p < 0.01$), 75 per cent reduction in patients with head and neck cancers referred from secondary care in 2020 compared with 2019.

Presentations via emergency department

In 2019, there were six patients with diagnosed head and neck cancers referred from the emergency department, compared with seven patients in 2020. In 2019, five patients (83.3 per cent) met the 31-day time-to-diagnosis target, compared to six patients (85.7 per cent) in 2020 ($p = 1$, Fisher's exact test). In 2019, the 62-day time-to-treatment target was met by three patients (50 per cent), compared to five patients (71.4 per cent) in 2020 ($p = 0.592$, Fisher's exact test).

Discussion

Main clinical findings

Urgent suspicion of cancer, and urgent and emergency referral pathways demonstrated increased compliance with the 31-day time-to-diagnosis and 62-day time-to-treatment targets during the UK national lockdown. The cancellation of all elective and

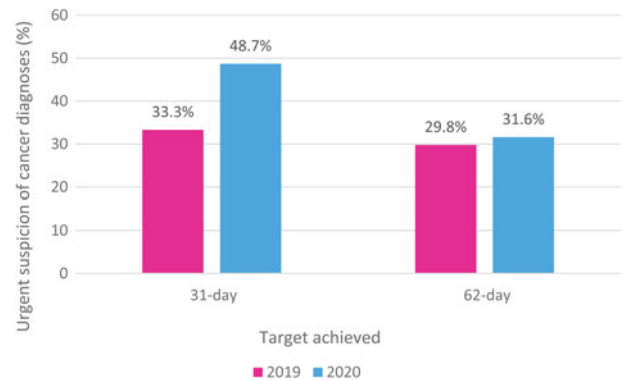


Fig. 2. Comparison of urgent suspicion of cancer 31-day diagnosis and 62-day treatment times between March–May 2019 and March–May 2020.

non-emergency work during the first wave of the Covid-19 pandemic resulted in a shift of NHS service provision towards Covid-19, emergency care and urgent cancer work. While the outcomes of these improvements to the pathways were not statistically significant, our study shows that head and neck cancer pathways did not suffer during the Covid-19 pandemic, and in fact may have benefitted from the streamlining of services.

As demonstrated in Figure 1, there was a significant reduction in the volume of patients referred with head and neck cancer from secondary care during the first wave of the Covid-19 pandemic. The reasons for this are unclear, but face-to-face appointments in other secondary care services were suspended, which potentially led to fewer referrals. Innovations introduced to enhance the running of out-patient clinics, radiology services, MDT meetings and operating theatre schedules resulted in reduced waiting times, and facilitated earlier diagnosis and access to treatment in 2020. In comparison, the same patient pathway in 2019 required multiple appointments to achieve the same results, delaying the process.

Urgent suspicion of cancer pathway

There are several issues with the urgent suspicion of cancer pathway that affect its ability to meet the 31- and 62-day targets. For instance, the number of referrals continues to increase year on year. In 2015, NHS Greater Glasgow and Clyde received 2200 urgent suspicion of cancer referrals within one year; by 2019, this number had risen to 4300.

The reasons for this increase are unclear. In our study, before any inclusion or exclusion criteria were applied, we received 141 (68.1 per cent) and 134 (72.4 per cent) urgent suspicion of cancer referrals in March–May 2019 and in March–May 2020 respectively. However, the 2020 figures represent the first wave of the pandemic when NHS care was focused on emergency and urgent cancer work, which undoubtedly led to fewer head and neck cancer referrals. There is some evidence to suggest that this rise may be accounted for by increased health-seeking behaviours in women (most urgent suspicion of cancer attenders are female) and by primary care physicians' fear of medicolegal action associated with non-referral.^{5,12} In addition, publication of the revised Scottish Referral Guidelines for Suspected Cancer in 2019 may have increased awareness of cancer red flag features in primary care.⁴

Poor compliance with red flag criteria by referrers leads to increasing numbers of inappropriate referrals via the urgent

suspicion of cancer referral pathway. This results in a system that is over-burdened by low-risk patients, with poorer access for those most in need. In contrast, referrals that ought to be urgent suspicion of cancer referrals are often made via alternative pathways.^{4,13} For example, only 56.4 per cent of the referrals in our study were urgent suspicion of cancer referrals.

Impact of coronavirus on cancer service delivery

Flexible laryngoscopy is an essential examination in a head and neck cancer diagnostic clinic. This is an AGP, as the laryngoscope needs to pass through the upper aerodigestive tract, where the viral load of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus, if present, is high.^{7,8} Flexible laryngoscopy therefore requires level 3 PPE to be worn, and the procedure needs to be carried out in a space where frequent room air changes are possible. No such facility was available in NHS Greater Glasgow and Clyde. This limited the number of patients that could be seen during each clinic.^{14–16} Nevertheless, our study shows that head and neck cancer pathway times did not suffer as a result of these changes.

The Covid-19 pandemic brought many changes to the running of head and neck cancer services in the West of Scotland. Enhanced vetting was implemented, with all patients undergoing telephone triage by a head and neck consultant prior to their face-to-face clinic appointment. This facilitated the assessment of high-risk patients with true red flag symptoms sooner than if conducted prior to the pandemic, as the telephone triage system filtered out the high volume of low-risk referrals with no true red flag features of head and neck malignancy.⁶

Another service-enhancing adaptation that developed following the onset of the pandemic was the prospective cover for all diagnostic clinics provided by our radiology colleagues. Being able to offer same-day ultrasound-guided biopsies from the out-patient clinic contributed to the reduced time-to-diagnosis in 2020 compared to the same period in 2019.

Given the reduced access to the operating theatre, the schedules for the most urgent cases were pooled; this was an additional innovation that sped up the time to tissue diagnosis. Patients requiring a general anaesthetic for a staging panendoscopy were able to undergo this sooner than in 2019, reducing the time-to-diagnosis and the initiation of treatment.

The changes implemented to the head and neck cancer service during the Covid-19 pandemic were dependent on seamless interdepartmental collaboration between surgery, radiology and pathology departments, with a strong intradepartmental focus on teamwork, effective communication and flexibility among the consultants in one of the largest UK ENT departments.

- Head and neck cancer is rapidly progressive, requiring prompt diagnosis and treatment
- There was a significant increase in urgent suspicion of head and neck cancer referrals during the coronavirus disease 2019 pandemic
- The classification of flexible laryngoscopy as an aerosol-generating procedure has had a considerable logistical impact on ENT out-patient departments
- Restructuring service provision for head and neck cancer pathways improved time-to-diagnosis and time-to-treatment during the pandemic
- Most patients do not meet the 31-day and 62-day targets of Scottish Government guidance

Ability to meet targets

Despite the general improvements to head and neck cancer pathways in 2020, the majority of all patients (87 patients (73.7 per cent) in 2019 and 84 patients (71.2 per cent) in 2020) did not meet their 31- and 62-day targets. This is a real-world audit that included all patients with new cancers, many of whom are not traditionally 'tracked' as part of targets, for example, unknown primary head and neck cancer cases. Many of the innovations brought in as a response to the Covid-19 pandemic have been dismantled as services return towards normal. We hope that some of the experience gained during the pandemic in terms of cancer pathway times can be used in the longer term to benefit our patients.

Conclusion

In 2020, we observed non-statistically significant improvements in the 31- and 62-day diagnosis and treatment targets for head and neck cancer in all pathways except for routine and secondary care referrals. However, the secondary care referral pathway saw a significant decline in referrals during the UK's first national lockdown. During the first wave of the Covid-19 pandemic, all non-emergency clinical care was initially suspended, which subsequently led to delays in the routine and secondary care referral pathways, but which resulted in better streamlined pathways for urgent suspicion of cancer and urgent referrals.

Irrespective of the impact of the Covid-19 pandemic, our ability to meet 31- and 62-day targets remains poor, with a minority of patients meeting targets across all referral pathways; treatment initiation times of 3 months are not uncommon. Urgent efforts to overhaul the head and neck cancer diagnostic and treatment pathways are required.

Competing interests. None declared

References

- 1 Cancer Research UK. Head and neck cancers statistics. In: <https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/head-and-neck-cancers> [14 February 2021]
- 2 Hanna TP, King WD, Thibodeau S, Jalink M, Paulin GA, Harvey-Jones E *et al.* Mortality due to cancer treatment delay: systematic review and meta-analysis. *BMJ* 2020;**371**:m4087
- 3 National Institute for Health and Care Excellence. Suspected cancer: recognition and referral. NICE guideline [NG12]. In: www.nice.org.uk/guidance/ng12 [14 February 2021]
- 4 Scottish Government. Scottish Referral Guidelines for Suspected Cancer. In: <https://www.gov.scot/publications/scottish-referral-guidelines-suspected-cancer-january-2019/> [14 February 2021]
- 5 Zeitler M, Fingland P, Tikka T, Douglas CM, Montgomery J. Deprivation in relation to urgent suspicion of head and neck cancer referrals in Glasgow. *Clin Otolaryngol* 2018;**43**:861–7
- 6 ENT UK INTEGRATE Head and Neck Cancer telephone triage service evaluation. In: https://www.entuk.org/sites/default/files/ENT%20UK%20HNC%20telephone%20triage%20interim%20report%201_0.pdf [14 February 2021]
- 7 ENT UK. Aerosol Generating Procedures (AGPs) within the ENT clinic. In: <https://www.entuk.org/aerosol-generating-procedures-agps-within-ent-clinic> [14 February 2021]
- 8 Jackson T, Deibert D, Wyatt G, Durand-Moreau Q, Adishes A, Khunti K *et al.* Classification of aerosol-generating procedures: a rapid systematic review. *BMJ Open Respir Res* 2020;**7**:e000730
- 9 Anagiotos A, Petrikos G. Otolaryngology in the COVID-19 pandemic era: the impact on our clinical practice. *Eur Arch Otorhinolaryngol* 2021;**278**:629–36
- 10 Health Protection Scotland, NHS National Services Scotland. Review of national and international guidance on infection prevention and control

- measures for Personal Protective Equipment (PPE) and Aerosol Generating Procedures (AGPs) for COVID-19 (last updated 17 August 2020). In: <https://www.hps.scot.nhs.uk/web-resources-container/review-of-national-and-international-guidance-on-infection-prevention-and-control-measures-for-personal-protective-equipment-ppe-and-aerosol-generating-procedures-agps-for-covid-19/> [14 February 2021]
- 11 Scottish Government. NHS Scotland performance against LDP standards. In: <https://www.gov.scot/publications/nhsscotland-performance-against-ldp-standards/pages/cancer-waiting-times/> [14 February 2021]
 - 12 McKie C, Ahmad UA, Fellows S, Meikle D, Stafford FW, Thomson PJ *et al.* The 2-week rule for suspected head and neck cancer in the United Kingdom: referral patterns, diagnostic efficacy of the guidelines and compliance. *Oral Oncol* 2008;**44**:851–6
 - 13 Tikka T, Kavanagh K, Lowit A, Jiafeng P, Burns H, Nixon IJ *et al.* Head and neck cancer risk calculator (HaNC-RC)—V.2. Adjustments and addition of symptoms and social history factors. *Clin Otolaryngol* 2020;**45**:380–8
 - 14 Bann DV, Patel VA, Saadi R, Gniady JP, Goyal N, McGinn JD *et al.* Impact of coronavirus (COVID-19) on otolaryngologic surgery: brief commentary. *Head Neck* 2020;**42**:1227–34
 - 15 Curran J, Calder N, Yaneza M, Iyer A. Reducing potential aerosol generation in flexible nasolaryngoscopy: a novel method. *J Laryngol Otol* 2020;**134**:744–6
 - 16 Lammers MJW, Lea J, Westerberg BD. Guidance for otolaryngology health care workers performing aerosol generating medical procedures during the COVID-19 pandemic. *J Otolaryngol Head Neck Surg* 2020;**49**:36