

ORAL HEALTH STATUS OF HEAD AND NECK ONCOLOGY PATIENTS UNDERGOING PRE - RADIOTHERAPY DENTAL ASSESSMENT: A 12- MONTH RETROSPECTIVE STUDY

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Background

Head and Neck Cancer (HANC) is the eighth most common cancer type in the UK, accounting for approximately 3% of all cancers in the UK, with in excess of 8500 cases annually. There are approximately 300 cases of such cancer in Northern Ireland annually.^{1,2} The peak age range for head and neck cancer diagnosis is between 65–69 years in both males and females, with over 95% of all cases being in individuals over the age of 40 years.³ Management of head and neck cancer typically entails an extensive multidisciplinary approach combining input from oral and maxillofacial surgery, ENT surgery, oncology, radiology, restorative dentistry and other specialties. The management may include treatment by surgery or by chemotherapy and radiotherapy, or a combination of modalities.⁴ The majority of patients receive surgery followed, in approximately 60% of cases, by radiotherapy.⁵

Guidance from the British Association of Head and Neck Oncologists states that all patients whose oral cavity, teeth, salivary glands and jaws that will be affected by treatment should have a pre-treatment dental assessment. The aim is to render the patient dentally fit prior to starting treatment. It enables to plan for extractions of doubtful prognosis teeth in the radiotherapy fields and also plan for restoration of remaining teeth.

Patients requiring treatment for HANC often have poorly maintained dentitions and high levels of dental disease, including caries and periodontal disease.⁶ Special consideration is given to teeth in the radiotherapy fields, teeth with poor prognosis or apical pathology and strategically important teeth.

This assessment should be done as early as possible to maximise the time available for treatment.^{7,8} Unfortunately, owing to the complexities of cancer diagnosis, treatment and management, this is challenging.^{9,10}

The Northern Ireland HANC multidisciplinary team convene weekly for case discussions. Those HANC patients who require pre-radiotherapy dental assessment are referred to the Centre for Dentistry Belfast.



Fig.1



Fig.2

Fig.3

Fig.4

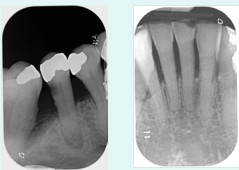


Fig.5

Fig.6

Figures 1-6 are pre-radiotherapy radiographs from a dental assessment of a 64 year old lady patient who was diagnosed with tonsillar cancer. There is presence of dental disease. There is generalised moderate to severe bone loss. Apical pathology is noted on teeth 34, 45. Secondary caries is noted on teeth 14, 13, 12, 11, 21 and 45.

Aim

The aim of this retrospective study was to determine the oral health status, and urgent treatment needs, of dentate head and neck cancer (HANC) patients undergoing pre-radiotherapy dental assessment in Northern Ireland.

This study wanted to:

- Examine the presence of dental diseases such as caries, periodontal disease, and apical pathology in these patients.
- Examine the urgent treatment needs of these patients i.e. Did these patients require extractions or restorations, and if so, how many?
- Compare and contrast the levels of dental disease and also treatment needs in the under 60 years old age group and the 60 years or older age group.

Methods

The HANC multidisciplinary team refer HANC patients who require dental assessment prior to radiotherapy to the Centre for Dentistry. Retrospective analysis of dental records of dentate patients who had previously attended for dental assessment at the Centre for Dentistry, Belfast, in 2019, were reviewed.

Clinical and radiological data relating to the pre-radiotherapy dental assessment of dentate HANC patients prior to radiation treatment was examined. Analysis was conducted for the entire calendar year of 2019.

The presence of dental disease and subsequent treatment needs was also noted.

Results

134 dentate HANC patients attended for pre-radiotherapy dental assessment in 2019.

Gender
90 (67.2%) patients were male and 44 (32.8%) patients were female.

Age
The age range was 31-81 years old.

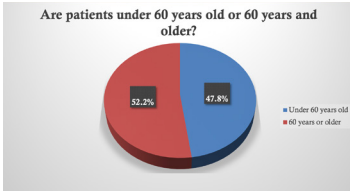


Figure 7. Are patients under 60 years old or are they 60 years and older?

70 (52.2%) patients were 60 years or older
64 (47.8%) patients were under 60 years old

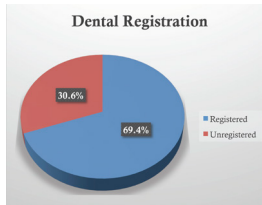


Figure 8. Dental Registration- Has the patient attended their General Dental Practitioner (GDP) within the last 12-18months? 93 (69.4%) patients were registered with a GDP

Caries
92 (68.7%) of total patients examined had carious teeth. In total, there were **310 carious teeth**.

Presence of carious teeth in the under 60 age group?
37 (57.8%) patients in this age group had carious teeth. 27 (42.2%) patients had no carious teeth.

Presence of carious teeth in the 60years or older age group?
55 (78.6%) patients in this age group had carious teeth. 15 (21.4%) patients had no carious teeth.

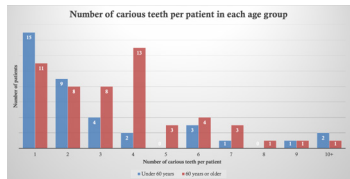


Figure 9. Number of carious teeth per patient in the under 60 years age group compared to the 60 years or older age group.

In total, **120 carious teeth** were present in the under 60 patient age group.

There was a **mean of 3.2 carious teeth** per patient with clinical caries in the under 60 age group.

In total, **190 carious teeth** were present in the 60 years or older patient age group.

There was a **mean of 3.5 carious teeth** per patient with clinical caries in the 60 years or older age group.

Periodontal disease

Overall, 108 (80.1%) patients were diagnosed with periodontal disease.

Under 60 years old age group:
46 (71.9%) patients were diagnosed with periodontal disease.

60 years or older age group
62 (88.6%) patients were diagnosed with periodontal disease.

Apical pathology

69 (51.5%) patients had the presence of apical pathology on at least one tooth radiographically.

In total, there were **142 teeth** with apical pathology.

Presence of apical pathology in the under 60 age group?
26 (40.6%) patients had apical pathology.
38 (59.4%) didn't have apical pathology.

Presence of apical pathology in the 60 years or older age group?
43 (61.4%) patients had apical pathology.
27 (38.6%) patients didn't have apical pathology

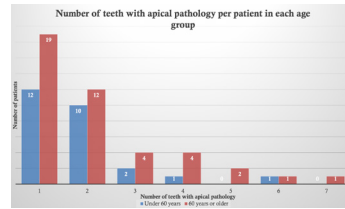


Figure 10. Number of teeth with apical pathology per patient in the under 60 years age group compared to the 60 years or older age group.

In total, there was apical pathology on **48 teeth** in the under 60 years old age group.

There was a **mean of 1.84 teeth** with apical pathology for those patients under 60 years old who demonstrated apical pathology.

In total, there was apical pathology on **94 teeth** in the 60 years or older group.

There was a **mean of 2.18 teeth** with apical pathology for those patients 60 years or older who demonstrated apical pathology.

Treatment needs

Extractions

Overall, 74 (55.2%) patients required extractions.

60 (44.8%) patients didn't require extractions.

In total, **310 teeth** required extraction.

Extractions in the under 60 years old age group

28 (43.8%) patients required extraction.

36 (56.2%) patients didn't require extraction.

Extractions in the under 60 years old age group

46 (65.7%) patients required extractions.

24 (33.3%) patients didn't require extractions.

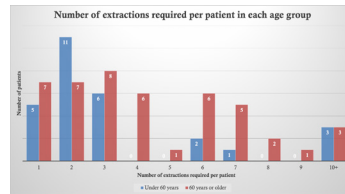


Figure 11. Number of teeth requiring extraction per patient in the under 60 years age group compared to the 60 years or older age group.

In total, **105 teeth** required extraction in the under 60 years old age group.

There was a **mean of 3.8 teeth** requiring extraction in those patients under 60 years old requiring extractions prior to radiotherapy.

In total, **205 teeth** required extraction in the 60 years or older age group.

There was a **mean of 4.5 teeth** requiring extraction in those patients 60 years or older requiring extractions prior to radiotherapy.

Restorations

Overall, 36 (27%) patients required restorations.

98 (73%) patients didn't require restorations.

In total, **83 teeth** required restorations.

Restorations in the under 60 years old age group.

16 (25%) patients required restorations.

48 (75%) patients didn't require restorations.

Restorations in the 60 years or older age group.

20 (29%) patients required restorations

50 (71%) patients didn't require restorations.

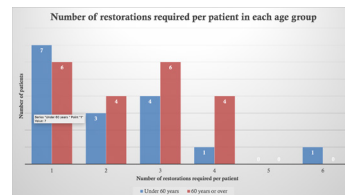


Figure 12. Number of restorations required per patient in the under 60 years age group compared to the 60 years or older age group.

In total, 35 teeth required restorations in the under 60 years old age group.

There was a **mean of 2.2 teeth** requiring restorations in those patients under 60 years old requiring restorations.

In total, **48 teeth** required restoration in the 60 years or older age group.

There was a **mean of 2.4 teeth** requiring restorations in those patients 60 years or older requiring restorations.

Root Canal Treatment (RCT)

7 patients required RCT. Each patient required RCT to 1 tooth.

4 patients under 60 years old required RCT and 3 patients 60 years or older required RCT.

The teeth requiring RCT comprised 3 incisors, 2 canines and 2 premolars.

Statistical Analysis

57.8% of the under 60 years age group had pre-radiotherapy caries compared to 78.6% of the 60 years or older age group. (p=0.016)

43.8% of the under 60 years age group needed at least one pre-radiotherapy extraction compared to 65.7% of the 60 years or older age group. (p=0.017)

40.6% of the under 60 age group had at least one tooth with apical pathology compared to 61.4% of the 60 years or older age group. (p=0.025)

No statistically significant differences in the percentage of patients in the under 60 years age group and the 60 years or older age group with pre-radiotherapy periodontitis or patients who require restorations or RCT prior to radiotherapy. (p>0.05)

There were also no statistically significant differences in the number of carious teeth, the number of teeth with apical pathology, the number of teeth to be extracted, and the number of teeth to be restored prior to radiotherapy in the under 60 years age group and the 60 years or older age group. (p>0.05)

Conclusions

HANC patients attending for pre-radiotherapy assessment have high levels of dental disease and treatment needs.

The patients in the 60 years or older age group are more likely to have caries, more likely to require extractions, and more likely to have apical pathology compared to those patients in the under 60 years age group.

Given the high prevalence of pre-existing dental disease amongst head and neck cancer patients, prompt dental assessment and treatment intervention is vital. This can be challenging due to the complexities of cancer diagnosis and multidisciplinary management.

References

1. Semple CJ, Killough SA. Quality of life issues in head and neck cancer Dental Update 2014; 41: 346-353.
2. Belfast Health and Social Care Trust. Head and neck cancer multidisciplinary team annual report 2019. Belfast: BHSC, 2019.
3. Jones O, Hackett S, Chatzistavrianou D and Newsom D. Head and Neck Cancer Part 1: Diagnosis and Classification. Dental Update 2019; 46: 722-729.
4. McCaul L. Oral and dental management for head and neck cancer patients treated by chemotherapy and radiotherapy. Dental Update 2012; 39: 135-140.
5. MacCarthy D, Omer O, Nunn J and Cotter E. Oral health needs of the head and neck radiotherapy patient: 1. Epidemiology, effects of radiotherapy and role of the GDP in diagnosis. Dental Update 2005; 32: 512-522.
6. Critchlow SB, Morgan C, Leung T. The oral health status of pre-treatment head and neck cancer patients. Br Dent J 2014; 216: E1.
7. Butterworth C, McCaul L, Barclay C. Restorative dentistry and oral rehabilitation: United Kingdom national multidisciplinary guidelines. J Laryngol Otol 2016; 130(S2): S41-44.
8. Moore C, Mc Lister C, O'Neill C, Donnelly M, Mc Kenna G. Pre-radiotherapy dental extractions in patients with head and neck cancer: a Delphi study. Journal of Dentistry 2020; 97: 1-10.
9. Omer O, MacCarthy D, Nunn J and Cotter E. Oral Health needs of the head and neck radiotherapy patient 2: Oral and dental care before, during and after radiotherapy. Dental Update 2005; 32: 575-582.
10. Barclay S and Turani D. Current practice in dental oncology in the UK. Dental Update 2010; 555-561.