

ASSESSMENT OF FUNCTIONAL OUTCOMES IN HEAD AND NECK CANCER PATIENTS

Mohit Bhatnagar¹, Pawan Kumar Saini²

¹Assistant Professor, Department of General Surgery, Venkateshwara Institute of Medical Sciences, NH-24, Jyotiba Phule Nagar, Uttar Pradesh, India

²Associate Professor, Department of General Surgery, Venkateshwara Institute of Medical Sciences, NH-24, Jyotiba Phule Nagar, Uttar Pradesh, India

Received : 02/07/2022
 Received in revised form : 22/08/2022
 Accepted : 31/08/2022

Keywords:
 Head and neck cancer,
 Remission,
 Tumour

Corresponding Author:
Dr. Mohit Bhatnagar,
 Email: drmohitonline@gmail.com
 ORCID: 0000-0003-1403-2858

DOI: 10.47009/jamp.2022.4.4.23

Source of Support: Nil,
 Conflict of Interest: None declared

Int J Acad Med Pharm
 2022; 4 (4); 109-113



Abstract

Background: To assess functional outcomes in head and neck cancer patients.

Materials and Methods: One hundred twelve patients diagnosed with head and neck cancer of either gender was selected. Parameter such as T stage, N stage, UICC stage, tumour site, p16 status, treatment performed, response observed etc. was recorded. History of smoking and alcoholism was recorded. Functional domain such as food intake, breathing, speech, pain, mood and mobility was also recorded. **Result:** Out of 112 patients, males comprised of 80 and females comprised of 42 patients. Functional domain food intake revealed integrity score 0 in 8%, 1 in 7%, 2 in 5%, 3 in 22% and 4 in 58%. Breathing showed integrity score of 0 in 1%, 1 in 4%, 2 in 5%, 3 in 12% and 4 in 78%. Speech showed integrity score of 0 in 5%, 1 in 4%, 2 in 7%, 3 in 30% and 4 in 54%. Pain showed integrity score of 0 in 2%, 1 in 4%, 2 in 11%, 3 in 23% and 4 in 60%. Mood integrity score of 0 was seen in 1%, 1 in 7%, 2 in 3%, 3 in 14% and 4 in 76%. Mobility integrity score 0 was seen among 2%, 1 in 4%, 2 in 6%, 3 in 20% and 4 in 68%. Smoking >10 pack year was seen in 86, <10 pack year in 36. Drinking daily in 64 and occasionally in 58. Tumour site was oral cavity in 54, oropharynx in 30, hypopharynx in 12, larynx in 12 and others in 4. T stage T0 was seen among 11, T1 in 25, T2 in 28, T3 in 20 and T4 in 28. N stage N0 in 42, N1 in 22, N2 in 28 and N3 in 20. UICC stage 1 was seen in 2, stage 2 in 25, stage 3 in 30 and stage 4 in 55. P 16 negative were 82 and positive 40. Treatment given was surgery only in 65, primary ST/RT in 30 and primary RT only in 27. Response was complete remission in 81, residual disease in 19 and second primary in 12 patients. The difference was significant (P< 0.05). **Conclusion:** Tumor site, tumor stage, and treatment modality had the strongest impact on functional outcome.

INTRODUCTION

Recent advances have significantly improved the survival of patients with head and neck cancer (HNC). This has led to more long-term survivors. Although survival is the most important outcome for HNC patients, other dimensions of treatment outcome such as physical status and functional abilities, psychological status and wellbeing, social interactions, and economic status are becoming increasingly important as a result of this trend.^[1]

Among the 40,000 new cases of HNC each year, the majority present with locoregionally advanced disease. Even before any intervention, the tumors themselves may be associated with symptoms and dysfunction such as pain and/or problems swallowing or speaking.^[2] Curative therapies, which primarily aim for locoregional tumor control, include combinations of surgical resection, radiation therapy, and chemotherapy. New treatment

strategies with increased treatment intensity offer patients a greater number of options and have succeeded in increasing rates of locoregional control but may be associated with even greater toxicity. Different treatments, modalities, and/or regimens confer varying degrees of organ preservation, differences in acute toxicity.^[3]

These dimensions of outcome are most often measured with quality of life (QoL) instruments, where QoL means the patient's subjective perception of their state and abilities in these domains. Currently, several instruments are available to assess health related QoL in HNC patients.^[4] Functional endpoints measure the degree to which patients can perform an activity. Specifically in the head and neck region, functional endpoints include seeing, hearing, smelling, tasting, speech, breathing, eating, and neck and shoulder mobility. The measurements of these functions can be patient-reported, observer-rated, or measured by

objective tests such as a barium swallow.^[5] We selected this study with the aim to assess functional outcomes in head and neck cancer patients.

MATERIALS AND METHODS

After considering the utility of the study and obtaining approval from ethical review committee of the institute, we selected one hundred twelve patients diagnosed with head and neck cancer of either gender belonging to the American Society of Anesthesiology (ASA) physical status I or II. Parameter such as T stage, N stage, UICC stage, tumour site, p16 status, treatment performed, response observed etc. was recorded. History of smoking and alcoholism was recorded. Functional domain such as food intake, breathing, speech, pain, mood and mobility was also recorded. The results were compiled and subjected for statistical analysis using Mann Whitney U test. P value less than 0.05 was set significant.

RESULTS

Out of 112 patients, males comprised of 80 and females comprised of 42 patients [Table 1].

Functional domain food intake revealed integrity score 0 in 8%, 1 in 7%, 2 in 5%, 3 in 22% and 4 in 58%. Breathing showed integrity score of 0 in 1%, 1 in 4%, 2 in 5%, 3 in 12% and 4 in 78%. Speech showed integrity score of 0 in 5%, 1 in 4%, 2 in 7%, 3 in 30% and 4 in 54%. Pain showed integrity score of 0 in 2%, 1 in 4%, 2 in 11%, 3 in 23% and 4 in 60%. Mood integrity score of 0 was seen in 1%, 1 in 7%, 2 in 3%, 3 in 14% and 4 in 76%. Mobility integrity score 0 was seen among 2%, 1 in 4%, 2 in 6%, 3 in 20% and 4 in 68% [Table 2].

Smoking >10 pack year was seen in 86, <10 pack year in 36. Drinking daily in 64 and occasionally in 58. Tumour site was oral cavity in 54, oropharynx in 30, hypopharynx in 12, larynx in 12 and others in 4. T stage T0 was seen among 11, T1 in 25, T2 in 28, T3 in 20 and T4 in 28. N stage N0 in 42, N1 in 22, N2 in 28 and N3 in 20. UICC stage 1 was seen in 2, stage 2 in 25, stage 3 in 30 and stage 4 in 55. P 16 negative were 82 and positive 40. Treatment given was surgery only in 65, primary ST/RT in 30 and primary RT only in 27. Response was complete remission in 81, residual disease in 19 and second primary in 12 patients. The difference was significant (P< 0.05) [Table 3].

Table 1: Patients distribution

| Total- 112 | | |
|------------|------|--------|
| Gender | Male | Female |
| Number | 80 | 42 |

Table 2: Assessment of functional domain

| Functional domain | Verbal rating | Integrity score | Percentage |
|-------------------|--|-----------------|------------|
| Food intake | No oral feeding | 0 | 8% |
| | Need of Gastrostomy tube | 1 | 7% |
| | No gastrostomy tube | 2 | 5% |
| | No gastrostomy tube, swallowing near normal | 3 | 22% |
| | Normal | 4 | 58% |
| Breathing | Tracheostoma, needs cuffed cannula | 0 | 1% |
| | Tracheostoma, speech cannula | 1 | 4% |
| | No tracheostoma, difficulties breathing on rest | 2 | 5% |
| | No tracheostoma, breathing difficulties only on exertion | 3 | 12% |
| | Normal | 4 | 78% |
| Speech | Not possible, without phonation | 0 | 5% |
| | no phone calls | 1 | 4% |
| | Phone calls possible | 2 | 7% |
| | Easy to understand | 3 | 30% |
| | Normal | 4 | 54% |
| Pain | Pain even with opiate use | 0 | 2% |
| | Pain controlled with opiate | 1 | 4% |
| | Needs non-opioid analgesics | 2 | 11% |
| | Needs analgesics time to time | 3 | 23% |
| | Normal | 4 | 60% |
| Mood | Suicidal thoughts | 0 | 1% |
| | depressed even with antidepressants | 1 | 7% |
| | Overall normal mood with antidepressants | 2 | 3% |
| | Occasionally depressed | 3 | 14% |
| | Normal | 4 | 76% |
| Mobility | Stiff neck, | 0 | 2% |

| | | | |
|--|--|---|-----|
| | hardly any movement | | |
| | Can hardly comb hair | 1 | 4% |
| | Combing with difficulty | 2 | 6% |
| | Combing and looking backwards in car slightly restricted | 3 | 20% |
| | Normal | 4 | 68% |

Table 3: Assessment of parameters

| Parameters | Variables | Number | P value |
|-------------|--------------------|--------|---------|
| Smoking | >10 pack year | 86 | 0.01 |
| | <10 pack year | 36 | |
| Drinking | Daily | 64 | 0.92 |
| | occasionally | 58 | |
| Tumour site | Oral cavity | 54 | 0.08 |
| | Oropharynx | 30 | |
| | Hypopharynx | 12 | |
| | Larynx | 12 | |
| | Others | 4 | |
| T stage | T0 | 11 | 0.86 |
| | T1 | 25 | |
| | T2 | 28 | |
| | T3 | 20 | |
| | T4 | 28 | |
| N stage | N0 | 42 | 0.95 |
| | N1 | 22 | |
| | N2 | 28 | |
| | N3 | 20 | |
| UICC | Stage 1 | 2 | 0.92 |
| | Stage 2 | 25 | |
| | Stage 3 | 30 | |
| | Stage 4 | 55 | |
| P 16 | Negative | 82 | 0.03 |
| | Positive | 40 | |
| Treatment | Surgery only | 65 | 0.04 |
| | Prim. ST/RT | 30 | |
| | Prim. RT only | 27 | |
| Response | Complete remission | 81 | 0.02 |
| | Residual disease | 19 | |
| | Second primary | 12 | |

DISCUSSION

Head and neck cancer (HNC) presents significant challenges to health care. In addition to concerns about survival, the disease and the side effects of aggressive treatments have the potential to severely affect function and quality of life (QOL).^[6] For this reason, evaluating these non-traditional outcomes has been recognized as critical in the evaluation and refinement of treatment strategies.^[7] Functional status is a measure of a patient's ability to perform specific activities, such as eating or swallowing.^[8] Conversely, QOL is a subjective measure of many factors, including emotional status, mental health, and physical and functional status.^[9,10] In HNC, the most frequently used performance or functional measure is the Performance Status Scale for Head and Neck Cancer (PSS-HN).^[11,12] Our study aimed to assess functional outcomes in head and neck cancer patients.

Out of 112 patients, males comprised of 80 and females comprised of 42 patients. DeJaco et al,^[13] observed that in 37 control subjects, 24 patients with HNC before treatment, and in 60 HNC patients after treatment, the HNC-FIT ratings in the 3 groups behaved as expected and functional domains correlated closely with the outcome of

corresponding scales of the EORTC-HN35-QoL questionnaire, indicating good construct and criterion validity. Interrater reliability (rICC) was ≥ 0.9 for all functional domains and retest reliability (rICC) was ≥ 0.93 for all domains except mood (rICC = 0.71). The treatment effect size (eta-square) as a measure of responsiveness was ≥ 0.15 for all domains except for breathing and neck and shoulder mobility. The median HNC-FIT scale completion time was 1 min 17 s. The HNC-FIT scale is a rapid tool for physician-rated assessment of functional outcomes in HNC patients with good validity, reliability, and responsiveness.

Our results showed that functional domain food intake revealed integrity score 0 in 8%, 1 in 7%, 2 in 5%, 3 in 22% and 4 in 58%. Breathing showed integrity score of 0 in 1%, 1 in 4%, 2 in 5%, 3 in 12% and 4 in 78%. Speech showed integrity score of 0 in 5%, 1 in 4%, 2 in 7%, 3 in 30% and 4 in 54%. Pain showed integrity score of 0 in 2%, 1 in 4%, 2 in 11%, 3 in 23% and 4 in 60%. Mood integrity score of 0 was seen in 1%, 1 in 7%, 2 in 3%, 3 in 14% and 4 in 76%. Mobility integrity score 0 was seen among 2%, 1 in 4%, 2 in 6%, 3 in 20% and 4 in 68%. Tschiesner et al,^[14] compared functional outcome in patients with advanced head and neck cancer (HNC) treated with (a) surgical

resection and reconstruction with microvascular free flaps (MVFF) followed by radiochemotherapy versus (b) primary radiochemotherapy (RCT) on the basis of the International Classification of Functioning, Disability and Health (ICF) from WHO. 27 patients were treated with MVFF and 22 with RCT. Global Quality of life scores suggested a slightly better functional outcome for the surgical approach. The majority of ICF categories (81/93, 87%) did not show a difference in functional outcome between the two treatment approaches. In the remaining 12 ICF categories, n = 3 body structures were more affected in the MVFF group, while n = 3 body functions, and n = 6 activities/participations were more problematic in the RCT group. This included oral swallowing and weight maintenance functions as well as social relationships, acquiring a job, and economic self-sufficiency. In addition, nine contextual environmental factors were more relevant to the RCT group. Both treatment approaches seemed appropriate to advanced HNC from the perspective of functional outcome.

We observed that smoking >10 pack year was seen in 86, <10 pack year in 36. Drinking daily in 64 and occasionally in 58. Tumour site was oral cavity in 54, oropharynx in 30, hypopharynx in 12, larynx in 12 and others in 4. T stage T0 was seen among 11, T1 in 25, T2 in 28, T3 in 20 and T4 in 28. N stage N0 in 42, N1 in 22, N2 in 28 and N3 in 20. UICC stage 1 was seen in 2, stage 2 in 25, stage 3 in 30 and stage 4 in 55. P 16 negative were 82 and positive 40. Treatment given was surgery only in 65, primary ST/RT in 30 and primary RT only in 27. Response was complete remission in 81, residual disease in 19 and second primary in 12 patients. Bundgaard et al,^[15] in their study the oral function of 81 consecutive patients with intraoral squamous cell carcinoma was assessed at diagnosis and during the follow-up 1-2 years after diagnosis. Patients received either radiotherapy, surgery, or radiotherapy and surgery. Speech function and tongue mobility were better among patients who received radiotherapy alone than among patients treated with surgery or combined therapy. Subjective complaints about mucositis, poor dental status, and loss of teeth were most pronounced among patients who received radiotherapy. Patients with tumor recurrence reported a poorer quality of life and found it more difficult to accept their treatment than patients with successful primary therapy. Patients with stage I tumors, notably patients treated with surgery, felt that their quality of life was good after treatment.

CONCLUSION

Tumor site, tumor stage, and treatment modality had the strongest impact on functional outcome.

REFERENCES

- List MA, D'Antonio LL, Cella DF, Siston A, Mumby P, Haraf D, et al. The Performance Status Scale for Head and Neck Cancer Patients and the Functional Assessment of Cancer Therapy-Head and Neck Scale. A study of utility and validity. *Cancer*. 1996;77(11):2294-301. doi: 10.1002/(SICI)1097-0142(19960601)77:11<2294::AID-CNCR17>3.0.CO;2-S.
- Webster K, Cella D, Yost K. The Functional Assessment of Chronic Illness Therapy (FACIT) Measurement System: properties, applications, and interpretation. *Health Qual Life Outcomes*. 2003;1:79. doi: 10.1186/1477-7525-1-79.
- Cella DF, Tulskey DS, Gray G, Sarafian B, Linn E, Bonomi A, et al. The Functional Assessment of Cancer Therapy scale: development and validation of the general measure. *J Clin Oncol*. 1993;11(3):570-9. doi: 10.1200/JCO.1993.11.3.570.
- Bjordal K, Ahlner-Elmqvist M, Tolleson E, Jensen AB, Razavi D, Maher EJ, et al. Development of a European Organization for Research and Treatment of Cancer (EORTC) questionnaire module to be used in quality of life assessments in head and neck cancer patients. EORTC Quality of Life Study Group. *Acta Oncol*. 1994;33(8):879-85. doi: 10.3109/02841869409098450.
- Bjordal K, Hammerlid E, Ahlner-Elmqvist M, de Graeff A, Boysen M, Evensen JF, et al. Quality of life in head and neck cancer patients: validation of the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire-H&N35. *J Clin Oncol*. 1999;17(3):1008-19. doi: 10.1200/JCO.1999.17.3.1008.
- Sherman AC, Simonton S, Adams DC, Vural E, Owens B, Hanna E. Assessing quality of life in patients with head and neck cancer: cross-validation of the European Organization for Research and Treatment of Cancer (EORTC) Quality of Life Head and Neck module (QLQ-H&N35). *Arch Otolaryngol Head Neck Surg*. 2000;126(4):459-67. doi: 10.1001/archotol.126.4.459.
- List MA, Ritter-Sterr CA, Baker TM, Colangelo LA, Matz G, Pauloski BR, et al. Longitudinal assessment of quality of life in laryngeal cancer patients. *Head Neck*. 1996;18(1):1-10. doi: 10.1002/(SICI)1097-0347(199601/02)18:1<1::AID-HED1>3.0.CO;2-7.
- D'Antonio LL, Zimmerman GJ, Cella DF, Long SA. Quality of life and functional status measures in patients with head and neck cancer. *Arch Otolaryngol Head Neck Surg*. 1996;122(5):482-7. doi: 10.1001/archotol.1996.01890170018005.
- Stenson KM, MacCracken E, List M, Haraf DJ, Brockstein B, Weichselbaum R, et al. Swallowing function in patients with head and neck cancer prior to treatment. *Arch Otolaryngol Head Neck Surg*. 2000;126(3):371-7. doi: 10.1001/archotol.126.3.371.
- Pauloski BR, Rademaker AW, Logemann JA, Colangelo LA. Speech and swallowing in irradiated and nonirradiated postsurgical oral cancer patients. *Otolaryngol Head Neck Surg*. 1998;118(5):616-24. doi: 10.1177/019459989811800509.
- Eisbruch A, Lyden T, Bradford CR, Dawson LA, Haxer MJ, Miller AE, et al. Objective assessment of swallowing dysfunction and aspiration after radiation concurrent with chemotherapy for head-and-neck cancer. *Int J Radiat Oncol Biol Phys*. 2002;53(1):23-8. doi: 10.1016/s0360-3016(02)02712-8.
- Osborn HA, Goldsmith TA, Varvares MA. Assessing functional outcomes in head and neck surgical oncology. *Head Neck*. 2019;41(7):2051-2057. doi: 10.1002/hed.25656.
- Dejaco D, Riedl D, Gasser S, Schartinger VH, Innerhofer V, Gottfried T, et al. A Tool for Rapid Assessment of Functional Outcomes in Patients with Head and Neck Cancer. *Cancers (Basel)*. 2021;13(21):5529. doi: 10.3390/cancers13215529.
- Tschiesner U, Schuster L, Strieth S, Harréus U. Functional outcome in patients with advanced head and neck cancer: surgery and reconstruction with free flaps versus primary

radiochemotherapy. Eur Arch Otorhinolaryngol. 2012;269(2):629-38. doi: 10.1007/s00405-011-1642-7.

15. Bundgaard T, Tandrup O, Elbrønd O. A functional evaluation of patients treated for oral cancer. A prospective

study. Int J Oral Maxillofac Surg. 1993;22(1):28-34. doi: 10.1016/s0901-5027(05)80352-2.