*East African Medical Journal Vol. 85 No. 4 April 2009*
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M. M. Solomon, BDS, MSc, Consultant, Department of Oral and Maxillofacial Surgery, Coast Provincial General Hospital, Mombasa, J. F. Onyango, BDS, MSc, FDSRCS, Senior Lecturer, Department of Oral and Maxillofacial Surgery, School of Dental Sciences, L. O. Nyabola, MSc, Department of Community Health, School of Medicine, A. Opiyo, MBChB, MMed, Consultant Radiologist, Department of Radiotherapy, Kenyatta National Hospital, P. O. Box 19676-00202, Nairobi, Kenya and M. L. Chindia, BDS, MSc, FFDRCSI, Associate Professor, Department of Oral and Maxillofacial Surgery, School of Dental Sciences, University of Nairobi, P. O. Box 19676-00202, Nairobi, Kenya

Request for reprints to: Dr. J. F. Onyango, Department of Oral and Maxillofacial Surgery, School of Dental Sciences, University of Nairobi, P. O. Box 19676-00202, Nairobi, Kenya

# MORBIDITY AND QUALITY OF LIFE AMONG HEAD AND NECK CANCER PATIENTS TREATED WITH RADICAL RADIOTHERAPY

M. M. SOLOMON, J. F. ONYANGO, L. O. NYABOLA, A. OPIYO and M. L. CHINDIA

## ABSTRACT

***Objectives:*** **To determine the relative frequency of acute radiation morbidity and their perceived effect on quality of life among head and neck cancer patients treated with radical radiotherapy.**
***Design:*** **A cross-sectional study.**
***Setting:*** **Kenyatta National Hospital, Nairobi.**
***Subjects:*** **Thirty eight patients comprising 28 males and 10 females with ages ranging between 21 and 69 years were evaluated.**
***Results:*** **Most of the tumours occurred in the nasopharynx (38.6%). The rest of the tumours were equally divided between the oral cavity and larynx (31.6%). All tumours except two were carcinomas. The two exceptions were a glomus tumour and a malignant melanoma. The patients had received doses of radiotherapy ranging between 58.5 Grey and 75.5 Grey. Of the 38 patients, 22 (53%) completed their treatment in the prescribed time while 16 (47%) had treatment interruption on account of radiation morbidity. The cumulative radiation done at the time of interruption ranged between 20 and 46 Grey. The most frequent symptom was dryness of the mouth while the most troublesome symptom was difficulty in tasting foods. The quality of life (QOL) did not vary by age, gender or tumour site. Patients who had treatment interruption had a better QOL than those who did not.**
***Conclusion:*** **This study provides information that should aid in communicating with the head and neck cancer patients scheduled for radiotherapy and in the design of preventive and interventional strategies aimed at enhancing patient support and rehabilitation.**

## INTRODUCTION

Despite advances in diagnostic and treatment techniques the cure rates for head and neck cancers have remained unchanged in the last 50 years with the five year survival rates stabilising at about 50% (1, 2). In those patients who survive and become disease-free intense treatment may lead to physical and/or psychosocial disabilities (3, 4). This lack of progress and potential for morbidity associated with treatment has led head and neck cancer researchers to broaden the scope of their agenda to include investigations of health related QOL as a measure of outcome (5). QOL is particularly relevant for patients with head and neck cancer because social interaction and emotional expression depends, to a great extent, on the structure and functional integrity of the head and neck region (6). It is, therefore, of great clinical interest to determine the manner in which patients perceive and cope with these treatment-associated morbidities in order to assess the degree of treatment success and rehabilitation needs (7). The aim of this study was to determine the frequency and severity of radiation morbidity and their perceived effect on the

QOL among head and neck cancer patients treated with radical radiotherapy at the Kenyatta National Hospital, (KNH) in Nairobi.

The study was approved by the KNH and University of Nairobi Ethics, Research and Standards Committee.

## MATERIALS AND METHODS

The study was carried out in the department of radiotherapy of KNH, which is the only public hospital in Kenya with a radiotherapy facility serving an estimated population of 30 million people. Its radiotherapy facility consists of the cobalt 60 external beam unit.

Between January and March 2006, patients who had completed radiotherapy for head and neck cancer within one month of the study period were consecutively invited to participate in a cross-sectional study of radiation morbidity and QOL. The period was specifically selected to provide an estimate of both the acute and cumulative effects of radiotherapy. Assessment of the patients' experience of radiation related side effects were made using selected items of the head and neck radiotherapy questionnaire (HNRQ) translated into Kiswahili. The selected items consisted of eight questions that covered symptoms related to the domains of pain, skin irritation, taste, saliva, chewing, speech, swallowing and psychological function. Patients rated each symptom on a seven point Linkert-type scale with one indicating that a given item was a "great deal" of trouble and seven indicating that the item was 'not at all' troublesome. The overall QOL rating for each patient was expressed as the mean of the score of the eight questions with the score ranging between eight points representing the worst and 56 points representing the best QOL. The score for each domain was the mean of the questions that applied to it. A mid-point between the two extremes was selected as a critical cut-off point between poor (0-32) and good (32-56) QOL experiences.

Because of the small numbers, patients' ages were grouped into two categories; those above and those below 50 years. Similarly, tumour sites were grouped into two: the oral sites for all tumour sites occurring in the oral cavity and other sites, for tumours occurring in the oropharynx, nasopharynx and larynx. The HNRQ was administered by a trained interviewer.

Patient and disease characteristics were summarised using descriptive statistics and presented as means, percentages, medians and ranges. The side effects ratings were summarised by percentage of the patients scoring above or below the 32 critical points value. Comparison between proportions of patients scoring above (good QOL) and below (poor QOL) the 32-points value was made with respect to age, gender and tumour site using Fisher's exact test with a 0.05 significance level and the 95% confidence interval. Statistical analysis was carried out using the Statistical Package for Social Sciences (SPSS) II for Windows (SPSS Inc, Chicago, IL, USA).

## RESULTS

*Patients, tumour, and treatment profile:* The profile of patients, tumours and treatment is shown in Table 1. Thirty eight patients comprising 28 males and 10 females aged between 21 and 69 years (Mean = 47 ± 13.39) were evaluated. The majority of the tumours occurred in the nasopharynx (38.6%). The rest of the tumours were divided equally between the oral cavity and larynx at 31.6%. All the tumours except two were carcinomas. The other tumours were a glomus tumour and a malignant melanoma. The patients received radiotherapy through the cobalt 60 external beam radiation in doses ranging between 58.8 Grey and 78.8 Grey (Median 70 Grey). Out of the 38 patients 16 (42%) had their treatment interrupted on account of radiation morbidity.

*Incidence and degree of debilitation of acute radiation morbidity:* The occurrence of acute radiation morbidity and the degree of debilitation are shown in Table 2. The most common side effect was dryness of the mouth or xerostomia (92.1%) followed by pain and soreness of the mouth, pain and itchiness of the skin, hoarseness or loss of voice and difficulty in swallowing in almost equal proportions. Other symptoms included difficulty tasting food (76.3%), anger/depression/fatigue (63.2%) and difficulty in chewing (55.3%). Of these symptoms, the one considered most troublesome by the majority of the patients was difficulty in tasting food (98%). This was followed by pain and soreness in the mouth (89%), dryness of the mouth (80%) and difficulty in swallowing (73%). Pain and itchiness of the skin, difficulty in chewing, hoarseness or loss of voice and anger/depression/fatigue were considered relatively less troublesome.

*Variation in QOL by gender, tumour site and treatment interruption:* Table 3 shows that there were no variations within and between QOL categories by age, gender or tumour site. There was, however, a significant difference in the QOL among patients who had treatment interruption and those who had not. Patients who had treatment interruption were more likely to have had a better QOL than those who had not.

**Table 1**
*Patient, tumour and treatment profile*

| Characteristic | No. | (%) |
|---|---|---|
| Gender | | |
| Male | 28 | 74 |
| Female | 10 | 26 |
| Age | | |
| Range | 21-69 | |
| Mean | 47 ± 13.39 | |
| Tumour site | | |
| Oral cavity | 12 | 31.6 |
| Nasopharynx | 14 | 38.8 |
| Larynx | 12 | 31.6 |
| Tumour type | | |
| Cancerous | 36 | 95 |
| Glomus tumour | 1 | 2.5 |
| Malignant melanoma | 1 | 2.5 |
| Radiation dose (Gy) | | |
| Range | 58.5-75.5 | |
| Mean | 70 | |
| Treatment interruption | | |
| Yes | 16 | 42.1 |
| No | 22 | 57.9 |
| Cumulative dose (Gy) | | |
| Range | 20-46 | |
| Median | 35 | |

**Table 2**
*Incidence and degree of debilitation of acute radiation morbidity*

| Symptom | Overall frequency (%) | Degree of debilitation (%) | | | |
|---|---|---|---|---|---|
| | | A great deal | A lot | A fair bit | Hardly any |
| Pain and soreness in the mouth | 86.8 | 89 | 10 | 7 | 3 |
| Pain and itchiness of the skin | 86.8 | 18 | 12 | 65 | 15 |
| Difficulty tasting food | 76.3 | 98 | 2 | - | - |
| Dryness of the mouth | 92.1 | 80 | 10 | 5 | 5 |
| Difficulty chewing | 55.3 | 25 | 10 | 10 | 55 |
| Hoarseness or loss of voice | 86.8 | 23 | 15 | 47 | 12 |
| Difficulty swallowing | 86.8 | 73 | 8 | 5 | 12 |
| Anger/Depression/Fatigue | 63.2 | 38 | 10 | 12 | 40 |

**Table 3**
*Variability of QOL by gender, tumour site and treatment interruption*

| | Overall Frequency (%) | Age(%) | | Gender (%) | | Tumour site (%) | | Treatment Interruption (%) | |
|---|---|---|---|---|---|---|---|---|---|
| | | <50 | >50 | M | F | Oral cavity | Others | Yes | No |
| QOL outcome | | | | | | | | | |
| Good QOL | 19 (50) | 78.9 | 21.1 | 73.3 | 26.3 | 15.8 | 84.2 | 57.9 | 42.1 |
| Poor QOL | 19 (50) | 36.8 | 63.2 | 73.3 | 26.3 | 47.4 | 52.6 | 26.3 | 73.3 |
| P-value | | 0.02 | | 1 | | 0.079 | | 0.049 | |

## DISCUSSION

The relative frequencies of the radiation morbidity in this study are high but largely similar to those reported in other studies (8-11). In the literature the most commonly reported radiation side effects are mucositis and xerostomia, both estimated at 80% (10, 12), skin reaction estimated at 90% (13), pain and suffering estimated at 69% (11) and pain on swallowing estimated at 56% (14). In the present study, 47% of the patients had their treatment interrupted on account of radiation morbidity. This relatively high incidence, however, is common and supports published data which show that about 30 to 50% of radical treatments are interrupted for various reasons (15-21). For example, in a study of patients with laryngeal tumours receiving radical therapy it was found that only 34% had their treatment within the prescribed time, 29% had their treatment prolonged by one or two days and 37% had a longer interruption (3-15 days) (21). In a related study among patients undergoing radiotherapy for head and neck cancer at KNH, it was found that 50% of the patients completed their treatment within the prescribed time, 7.7% had their treatment interrupted by one to five days, 58.8% by six to ten days and 38.5% by over 10 days (22). However, the prolongation of the overall time taken for delivery of a radical course of radiotherapy arising from unscheduled interruption in the treatment affect cancer control and cure rates and should be avoided or compensated for.

In the assessment of the impact of radiation morbidity on QOL, it was curious that most patients found loss of taste to have been more debilitating than other side effects, such as pain and dryness of the mouth. However, this finding needs to be treated with caution because there are possible problems associated with translation and misinterpretation of the questionnaire, which was developed primarily for a culturally different population. It was, however, disturbing that despite the severity of symptoms no patients received nutritional support. It has been estimated that 20-30% of patients undergoing radical radiotherapy for head and neck cancer required parenteral feeding on account of mucositis (9). In patients who are nutritionally compromised, failure to provide supplemental feeding during radical radiation therapy enormously erodes the prognosis and the QOL.

In this study the impact of radiation morbidity on the QOL did not vary with age, gender or tumour site. However, data from studies on the influence of age and gender on QOL of cancer patients are conflicting. In some studies no gender difference was noticed (23) whereas in others a worse QOL was reported for women (24 - 26). Similarly, in some studies no influence of age on QOL was found (27) while in others better QOL was found among younger patients (28). Although not apparent in our study, tumour site has been reported as having a definite influence on the QOL among head and neck cancer patients (29). Patients with pharyngeal cancer have been shown to suffer more severe morbidity and to have a poorer QOL as opposed to those with oral or laryngeal cancer (29). The apparent lack of variation of the QOL with tumour site in our study was probably due to the relatively small sample size.

The difference in the QOL between patients who had and those who did not have treatment interruption is understandable. The period of rest provided by treatment interruption allowed patients to recover from side effects as opposed to those who did not. However, while the patients may have felt better, their prognosis may have been severely eroded by treatment interruptions. An ideal treatment should aim at reducing the side effects without compromising prognosis.

In conclusion, this study provides information that should help in communicating with head and neck cancer patients undergoing radical radiotherapy and in the design of preventive and interventional strategies aimed at enhancing patient support and rehabilitation.

## ACKNOWLEDGEMENTS

To the Director of Medical Services, Ministry of Health, who provided the grants for this study, the Director of Kenyatta National Hospital for allowing us to carry out this study and the Supervisors, both at the Kenyatta National Hospital and at the School of Dental Sciences, for providing guidance in the course of this study.

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