

# ASSESSING CHANGES IN BODY COMPOSITION AND NUTRITIONAL STATUS OF HEAD AND NECK CANCER PATIENTS UNDERGOING RADIOTHERAPY AT ALEXANDRIA

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## Introduction

Malnutrition in cancer patients is very prevalent as at the time of diagnosis about half have some nutritional deficit. This deficit can happen in any setting and with any cancer types. Data has shown that gastrointestinal tract and head and neck (HNC) patients have the highest risk of malnutrition with some literature indicating HNC has the highest risk. This is because of the pre-treatment conditions, demographic factors, tumour itself, catabolic inflammation, reduced or increased resting energy expenditure and treatment modalities. Methods to assess malnutrition include DEXA x-ray, CT scan, MRI and bioelectrical impedance analysis (BIA).

## Aim of the work

Quantitatively evaluate changes in the body composition (BC) and nutritional status using BIA that occur in HNC patients undergoing radiotherapy at Alexandria.

## Subjects

Patients between the ages of 18 and 70 years with histologically confirmed diagnosis of HNC.

•Patients receiving radiotherapy.

### Exclusion criteria

- Patient with a pacemaker
- Patients with advanced kidney disease and decompensated liver failure.
- Patients who did not get a minimum of two radiotherapy treatments and BIA readings.

## Methods

This was a prospective observational study with a sample size of 31 done between April 2021 and September 2021. Patients were evaluated during their radiotherapy treatment and their BC parameters of weight, fat mass (FM), fat free mass (FFM) and fat free mass index (FFMI) measured using BIA at baseline, mid cycle and end of treatment.

## Results

The study found that majority of Egyptian patients in Alexandria with head and neck cancer are overweight as the average BMI at baseline was 28.36kg/m<sup>2</sup>. There were no underweight patients in the study. Interestingly, with BIA there were sarcopenic patients at baseline and at end of treatment ( 6% and 19% respectively). In the study patients lost approximately 5.33% of their weight, 10.5% of their FM and 4.2% of their FFM after treatment. At the end of treatment 58% of the patients were malnourished as defined by the WHO definition of weight loss of greater than 5% of baseline weight. In the univariate and multivariate analysis these results were statistically significant at p<0.05 suggesting that radiotherapy does impact nutritional status of head and neck cancer patients as they get treatment.

Table (1): Changes in nutritional parameters during radiation therapy (x ± s)

Variable	Baseline	Mid-Cycle	End-Cycle	p-Value
	Mean (SD)	Mean (SD)	Mean (SD)	
Weight (kg)	78.02± 12.56	75.90 ± 12.33	73.86 ± 12.27	(P = .00)
BMI (kg/m <sup>2</sup> )	28.36 ± 4.95	31.87 ± 24.60	26.83 ± 4.70	(P = .00)
FM (kg)	22.90 ± 7.87	22.15 ± 7.45	20.99 ± 6.97	(P = .00)
FFM (kg)	55.12 ± 8.35	53.87 ± 8.28	52.68 ± 7.99	(P = .00)
FFMI (kg/m <sup>2</sup> )	19.89 ± 2.17	19.40 ± 2.25	19.00 ± 2.18	(P = .00)

Majority of the patients in the study were males (71%). Patients who smoked, had little education and were either unemployed or retired or were housewives were more likely to have greater change to their nutritional status. Interestingly those with secondary education gained 0.23kg of FM.

Those younger than 60 years lost more weight of 4.34±0.15kg and FFM of 3.22±0.61kg as compared to those with more than 60 years. Females lost more weight of 4.43kg than males but males lost more FFM of 2.56 kg than females.

Stage II had the largest weight loss of 5.7±2.69 kg while stage III had the biggest loss in FFM of 2.51±0.04kg. RT doses above 60 Gy caused greater weight and FFM mass loss than those who got less than 60 Gy RT dose. Patients getting CCRT were also the most likely to have changes in the weight and FFM. However these findings in the multivariate analysis were not statistically significant.

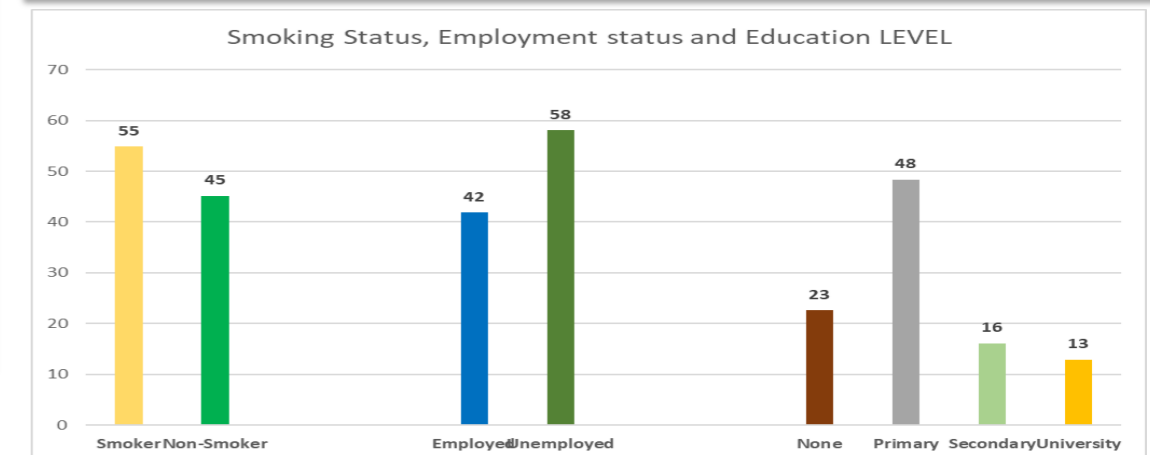


Figure (1): Bar charts on smoking status, employment status and education levels

## Conclusion

The study found that there are statistically significant changes to patients body composition and nutritional status as they get radiotherapy for head and neck cancer. It also implied that BMI alone is not enough for nutritional assessment and BIA in a low resource setting can be used to assess and follow-up patients BC and nutritional status.