

# Analysis of Nutritional status of Cancer patients on Chemotherapy

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## Abstract

Patients are imposed on nutritional risk due to cancer itself as well as due to its treatment also. It has been found through many researches that nutritional assessment at initial stages of treatment may prevent many complications during & post treatment. Therefore, the present study was planned to find out and analyze nutritional status of patients who were undergoing chemotherapy.

**Methods:** A prospective observational study was conducted in the out patients of oncology department who were undergoing chemotherapy among 50 subjects between 19- 59 years of age. Duration of the study was of 3 months. Nutritional status of the patients was assessed using Subjective global assessment (SGA) tool that was based on anthropometry, biochemical reports, clinical examination and dietary intake of patients.

**Results:** The results showed that 70% patients were at risk of malnutrition while 10% patients were malnourished. Majority of patients in this category were suffering from head and neck cancer. In total, most cancer cases were of head & neck cancer followed by breast cancer and liver cancer. During chemotherapy, majority of patients showed BMI < 18.5 Kg/M<sup>2</sup>. Most of the patients suffered from loss of appetite, oral ulcers, weakness that led to decreased food intake.

**Conclusion:** It can be concluded from the present study that cancer and treatment of cancer both put patients at nutritional risk by causing increased nutritional needs and decreased food intake. It can be prevented or treated by early detection of nutritional status, so that timely decision can be taken for right nutritional intervention for them.

## Keywords

Cancer, chemotherapy, nutritional status, dietary recall, anthropometric measurement

## Introduction

Cancer is a chronic non-communicable disease caused by uncontrolled cell growth is mainly influenced by the genetic and environmental factors and cause many complications such as progressive decline in organ function. As per the Indian Council of Medical Research 2016, new cancer cases reported in India were approximately 14.5 lakh and these were expected to reach to 17.3 lakh in 2020 (Nayak *et al.*, 2017). Nutrition plays very major role in cancer prevention and treatment. Problem of weight loss is very common in most of the cancer patients that may further precipitate into poor survival and impaired response to treatment (Khoshnevis *et al.*, 2012). As per Paccagnella *et al.* (2010), nutritional depletion in cancer patients is very common.

Chemotherapy is an important treatment for cancer that may cause many problems that may hamper food intake e.g., nausea, vomiting, diarrhea, constipation, mucositis, xerostomia and food aversions. Decreased food intake may further aggravate the complications by loss of nutrients, alterations in energy expenditure and loss of lean body mass (Beena *et al.*, 2014). Malnutrition is an obstacle in cancer patients and increasing death not only for their prevalence of disease but also unconcern about dietary habits (Muscaritoli *et al.*, 2017).

Malnutrition prevalence may range from 40-80% in cancer patients. This may be attributed to the enhanced basal energy requirements because of disease and diminished dietary intake due to many side effects of treatment. Weight loss in simple starvation is resolved by re-feeding that resumes optimum nutritional status but weight loss in cancer doesn't restore easily by re-feeding as abnormal tumor synthesis itself makes it very difficult to replenish muscle mass. Therefore, the present study was planned with the aim to find out nutritional status of cancer patients who were undergoing chemotherapy.

### **Broad objective**

- To assess nutritional status of cancer patients on chemotherapy and to compare it with lifestyle, demography and type of disease

### **Specific objectives**

- To study demographic profile of the respondents
- To study prevalence of type of cancer
- To study lifestyle practices of patients in relation to type of cancer
- To record anthropometric measurements of the respondents
- To study the biochemical profile of the respondents
- To examine patients for clinical signs & symptoms in relation to type of cancer
- To record dietary information of the patients

### **Methodology**

**Purpose of the study:** Assessment of Nutritional status of cancer patients who were on chemotherapy

**Duration of study:** 3 months

**Study population:** The Population for this study included all cancer patients arriving for chemotherapy in oncology OPD at Mahatma Gandhi Medical College & Hospital.

**Sampling Technique:** Purposive sampling technique was used for the present study

**Sample size:** 50

### **Inclusion criteria**

- Patients between 19 - 59 years age of both genders
- Patients on chemotherapy alone
- Patients willing to take part in the study

### **Exclusion criteria**

- Patients more than 59 years age and less than 19 years
- Patients on radiation therapy
- Unwilling/ non-cooperative ones
- Patients who are critically ill or those with significant cognitive impairment

### **Methodology**

- **Collection of demographic data:** To collect demographic profile of patients, a well structured questionnaire was prepared in advance, was given to patients or attendants (in case patient was not able to fill it) and information was recorded for patient's age, sex, educational status, economic status, occupation, marital status and family history of cancer.
- **Prevalence of type of cancer:** Data for occurrence of particular type of cancer was also recorded separately.
- **Collection of lifestyle practices:** Data collection was done for various lifestyle practices like consumption of gutka, pan, supari, smoking and alcohol that may impose risk of cancer. Besides this, consumption of excessive spices, high fat diet and junk food was also noted.
- **Anthropometric measurements:** In this, height of the subjects was measured using a heightometer and weight was recorded by a digital weighing balance. Body mass index was calculated by the formula:  $\text{Weight (Kg)} / \text{Height (M}^2\text{)}$ .
- **Biochemical reports:** Reports of the subjects were get done for hemoglobin, platelet count, WBC count etc. from standard laboratory.
- **Clinical examination:** Clinical signs & symptoms were recorded using a checklist with following signs and symptoms: Oral ulcers, pain, weakness, mucositis, xerostomia, weight loss, cough, anorexia, loss of appetite, diarrhea, constipation, nausea, vomiting etc.

- **Dietary intake:** It was recorded using a 24 hour dietary recall that was done for 3 consecutive days – one being holiday and two working day's dietary recall was recorded on a pre structured questionnaire
- **Statistical analysis:** Mean and percentage were calculated. Then ANOVA was applied to find out significant difference and interpretation of data was done in the form of graphs and tables.

## Results and discussion

As it was evident from many researches that cancer patients on chemotherapy were at risk of malnutrition, therefore present study was planned to assess nutritional status of cancer patients arriving in Oncology OPD in Mahatma Gandhi Medical College and Hospital, Jaipur. The data obtained has been divided into following parts –

1. Demographic profile of patients
2. Prevalence of type of cancer
3. Lifestyle practices of patients in relation to type of cancer
4. Anthropometric measurements
5. Biochemical reports
6. Clinical signs and symptoms in relation to type of cancer
7. Dietary intake
8. Assessment of nutritional diagnosis as per SGA rating on the basis of anthropometry, dietary intake and clinical examination.
9. Comparison of nutritional status with demographic data
10. Comparison of nutritional status with lifestyle practices
11. Comparison of nutritional status with type of cancer

### 1. Demographic profile of patients

Table 1 is depicting that during the study period, 50 patients were included and evaluated. The mean age of patients was  $55.3 \pm 12.84$  years in which (30) 60 % were male and (20) 40% were female. When educational status of patients was recorded, it was found that Sixty percent (30) patients were graduated. Sixty percent patients were working and 42 out of 50 i.e., 84% patients were having sedentary life style. Majority of them (56%) were from middle income group and 66% patients were married.

| <b>Variable</b>          | <b>No. of patients<br/>[n=50]</b> | <b>Percentage [%]</b> |
|--------------------------|-----------------------------------|-----------------------|
| <b>Age ( years )</b>     |                                   |                       |
| 19-40 years              | 13                                | 26                    |
| 40-50 years              | 10                                | 20                    |
| 51-59 years              | 27                                | 54                    |
| <b>Gender</b>            |                                   |                       |
| Male                     | 30                                | 60                    |
| Female                   | 20                                | 40                    |
| <b>Education</b>         |                                   |                       |
| Illiterate               | 0                                 | 0                     |
| Primary                  | 3                                 | 6                     |
| Metric                   | 8                                 | 16                    |
| .Graduate                | 30                                | 60                    |
| Post graduate            | 9                                 | 18                    |
| <b>Working status</b>    |                                   |                       |
| Working                  | 30                                | 60                    |
| Non working              | 20                                | 40                    |
| <b>Types of activity</b> |                                   |                       |
| Sedentary                | 42                                | 84                    |
| Moderate                 | 8                                 | 16                    |
| <b>Economic</b>          |                                   |                       |
| LIG                      | 13                                | 26.                   |
| MIG                      | 28                                | 56                    |
| HIG                      | 9                                 | 18                    |
| <b>Marital status</b>    |                                   |                       |
| Married                  | 33                                | 66                    |
| Unmarried                | 17                                | 34                    |

Table 1: General information and demographic profile of patients

Shariat et al., 2010 also studied correlation of age and sex with incidence of urinary bladder cancer and quoted in their research that there is 3- 4 times more likelihood of developing urinary bladder cancer rather than women while women are presented with after more progression of the disease with worsened severity and lesser survival rates.

## 2. Prevalence of types of cancer

| Types of cancers            | N= 50 | Percentage |
|-----------------------------|-------|------------|
| Ca Buccal Mucosa            | 15    | 30         |
| Ca esophagus                | 5     | 10         |
| Ca lung                     | 5     | 10         |
| Ca lip/ tongue/ soft palate | 1     | 2          |
| Ca cervix                   | 5     | 10         |
| Ca breast                   | 10    | 20         |
| Ca liver                    | 6     | 12         |
| Ca pancreas                 | 1     | 2          |
| Ca urinary bladder          | 1     | 2          |
| Ca colon                    | 1     | 2          |

Table 2: Prevalence of types of cancer

Study of prevalence of type of cancer showed that most of the patients suffered with cancer of buccal mucosa (30%), followed by breast cancer and hepatic carcinoma. Incidences of lung, oesophagus and cervix cancer were observed in equal magnitude (10% each). Forman *et al.* (2003) stated incidences of cancer in females at 2.5% and in males at 1.5% in 1992 that was seen at a higher rate (approximately 7.5%) after the age of 65 years.

## 3. Lifestyle practices of patients with correlation to type of cancer

| Lifestyle habits                  | N = 50 | Percentage | Type of cancer                         |
|-----------------------------------|--------|------------|----------------------------------------|
| Consumption of gutkha supari, pan | 20     | 40         | Buccal mucosa, tongue, lip, oesophagus |
| Smoking                           | 15     | 30         | Oesophagus, lungs                      |
| Alcohol                           | 9      | 18         | Liver                                  |
| Excessive spicy food              | 30     | 60         | Pancreas, oesophagus                   |
| High fat junk food                | 20     | 40         | Breast, colon, liver,                  |

|      |   |    |                  |
|------|---|----|------------------|
|      |   |    | cervix, pancreas |
| None | 6 | 12 | Any type         |

Table 3: Lifestyle practices of patients.

Table 3 is presenting lifestyle habits of patients. It is evident that 40% patients had habit of consumption of gutkha, pan and supari while 30% patients were habitual of smoking. Nine out of 50 patients showed habit of regular consumption of alcohol while 12% patients didn't follow any of these practices. Besides this, it was noted that 60% patients consumed excessively spicy foods that was associated with cancer of pancreas and oesophagus. High fat junk food was found to have association with breast cancer followed by colon, liver and cancer of pancreas. Similar types of findings were noted by La Vecchia (1992) who reported in their study that high fat diet was associated with higher incidences of colorectal cancer with greater number of breast cancer cases with diet high in saturated fat as well.

#### 4. Anthropometric measurements of the patients

| Parameter                 | Range     | Male (N = 30) |            | Female (N = 20) |            |
|---------------------------|-----------|---------------|------------|-----------------|------------|
|                           |           | Number        | Percentage | Number          | Percentage |
| Height (cm)               | 150-160   | 5             | 16.66      | 15              | 75         |
|                           | 160-170   | 20            | 66.66      | 5               | 25         |
|                           | >170      | 5             | 16.66      | 0               | 0          |
| Weight (kg)               | < 50      | 5             | 16.66      | 15              | 75         |
|                           | 50-60     | 20            | 66.66      | 5               | 25         |
|                           | 60-70     | 4             | 13.33      | 0               | 0          |
|                           | >70       | 1             | 3.33       | 0               | 0          |
| BMI (Kg/ M <sup>2</sup> ) | < 18.5    | 10            | 33.33      | 20              | 100        |
|                           | 18.5-22.9 | 15            | 50         | 0               | 0          |
|                           | 23-24.9   | 5             | 16.66      | 0               | 0          |
|                           | 25.29     | 0             | 0          | 0               | 0          |

Table 4: Anthropometric measurements of the patients.

Above table 4 is showing height, weight and BMI of the male and female patients. It is evident that mean height of males was between 160 -170 cm and 75% female's height was in the range of 150 – 160 cm. Weight of 66.66% males was observed between 50 – 60 kg, while 75% females showed their weight in the range of 50 – 60 Kg. It was found that majority of male and female patients showed BMI < 18.5 Kg/M<sup>2</sup>. This was very much in harmony with the findings of Geirsdottir & Thorsdottir, 2008.

## 5. Biochemical parameters of the patients

| S.No. | Biochemical report | Males (Mean values)       | Interpretation               | Females (Mean values)    | Interpretation               |
|-------|--------------------|---------------------------|------------------------------|--------------------------|------------------------------|
| 1     | Hemoglobin         | 12.5                      | Mild anemia                  | 9.3                      | Moderate anemia              |
| 2     | WBC                | 4 x 10 <sup>3</sup> /ul   | Lower immunity               | 3 x 10 <sup>3</sup> /ul  | Lower immunity               |
| 3     | Platelet           | < 50 x10 <sup>3</sup> /ul | 1.50-4.10 10 <sup>3</sup> /u | < 25 10 <sup>3</sup> /ul | 1.50-4.10 10 <sup>3</sup> /u |
| 4     | Creatinine         | 1.3                       | Normal                       | 0.63                     | Normal                       |
| 5     | SGOT/ SGPT         | 27.96/13.16               | Normal                       | 41.26/34.86              | Normal                       |
| 6     | Random blood sugar | 87                        | Normal                       | 132                      | Normal                       |
| 7     | Albumen            | 4                         | Normal                       | 3.6                      | Normal                       |

Table 5: Mean biochemical reports of the patients

Above table 5 is showing mean biochemical reports of the patients in which it is evident that a significant number of patients ( $p < 0.01$ ) both male & female were anemic and thrombocytopenia was also very common in these patients with reduced white blood cell count. It led to lower levels of immunity therefore these patients are more prone to infections. Lower platelets count is in consonance with the results of Soff *et al.*, 2019.

## 6. Clinical signs and symptoms of patients in relation to type of cancer

| Parameter        | Number (N= 50) | Percentage | Type of cancer                                |
|------------------|----------------|------------|-----------------------------------------------|
| Oral ulcer       | 30             | 60         | Head & neck cancer                            |
| Pain             | 20             | 40         | Liver, colorectal, head & neck                |
| Weakness         | 40             | 80         | All types                                     |
| Mucositis        | 25             | 50         | Head & neck cancer, oesophagus                |
| Xerostomia       | 30             | 60         | Head & neck cancer, oesophagus                |
| Cough            | 10             | 20         | Lung & respiratory tract tumors               |
| Anorexia         | 40             | 80         | All types                                     |
| Weight loss      | 35             | 70         | Head & neck cancer, liver, colorectal cancers |
| Loss of appetite | 40             | 80         | All types                                     |
| Diarrhoea        | 3              | 6          | Colorectal                                    |
| Constipation     | 20             | 40         | Head & neck cancer, liver                     |
| Nausea           | 30             | 60         | All types of cancers                          |

|          |    |    |                      |
|----------|----|----|----------------------|
| Vomiting | 25 | 50 | All types of cancers |
|----------|----|----|----------------------|

Table 6: Clinical signs and symptoms in patients

It is clear from the above table 6 that 80% of patients felt weakness, anorexia and loss of appetite while 70% patients suffered with problem of weight loss. Sign of oral ulcers and xerostomia were observed in 60% cases followed by mucositis and vomiting. It is very much similar to the findings of Duncan *et al.* 2005.

## 7. Dietary intake of cancer patients

| S.No                     | Food groups   | Raw Quantity | Calorie (Kc | Protein (g) | Carbohydrate (g) | Fat (g)     |
|--------------------------|---------------|--------------|-------------|-------------|------------------|-------------|
| 1                        | Cereals       | 150 g        | 500         | 18          | 105              | 2.5         |
| 2                        | Pulses        | 25 g         | 86          | 6           | 15               | 0.6         |
| 3                        | Vegetables    | 200 g        | 102         | 4           | 20               | 0.2         |
| 4                        | Fruits        | 200 g        | 100         | 1.2         | 22               | 0.6         |
| 5                        | Milk products | 400 ml       | 184         | 12.8        | 20               | 6           |
| 6                        | Fat           | 4 tsp        | 180         | 0           | 0                | 20          |
| 7                        | Sugar         | 4 tsp        | 80          | 0           | 20               | 0           |
| 8                        | Dry fruits    | 20 g         | 90          | 3.4         | 47               | 8.5         |
| <b>Total mean intake</b> |               |              | <b>1322</b> | <b>45.4</b> | <b>249</b>       | <b>38.4</b> |

Table 7: 24 hrs mean food and nutrient intake of male cancer patients

| S.No | Food groups | Raw Quantity | Calorie (Kc | Protein (g) | Carbohydrate (g) | Fat (g) |
|------|-------------|--------------|-------------|-------------|------------------|---------|
| 1    | Cereals     | 100 g        | 333         | 12          | 70               | 1.66    |
| 2    | Pulses      | 25 g         | 86          | 6           | 15               | 0.6     |
| 3    | vegetables  | 200 g        | 102         | 4           | 20               | 0.2     |

|   |                          |        |            |             |              |              |
|---|--------------------------|--------|------------|-------------|--------------|--------------|
| 4 | Fruits                   | 100 g  | 50         | 0.6         | 11           | 0.3          |
| 5 | Milk products            | 200 ml | 92         | 6.4         | 10           | 3            |
| 6 | Fat                      | 3 tsp  | 135        | 0           | 0            | 15           |
| 7 | Sugar                    | 4 tsp  | 80         | 0           | 20           | 0            |
| 8 | Dry fruits               | 10 g   | 45         | 1.7         | 23.5         | 4.25         |
|   | <b>Total mean intake</b> |        | <b>923</b> | <b>30.7</b> | <b>169.5</b> | <b>25.01</b> |

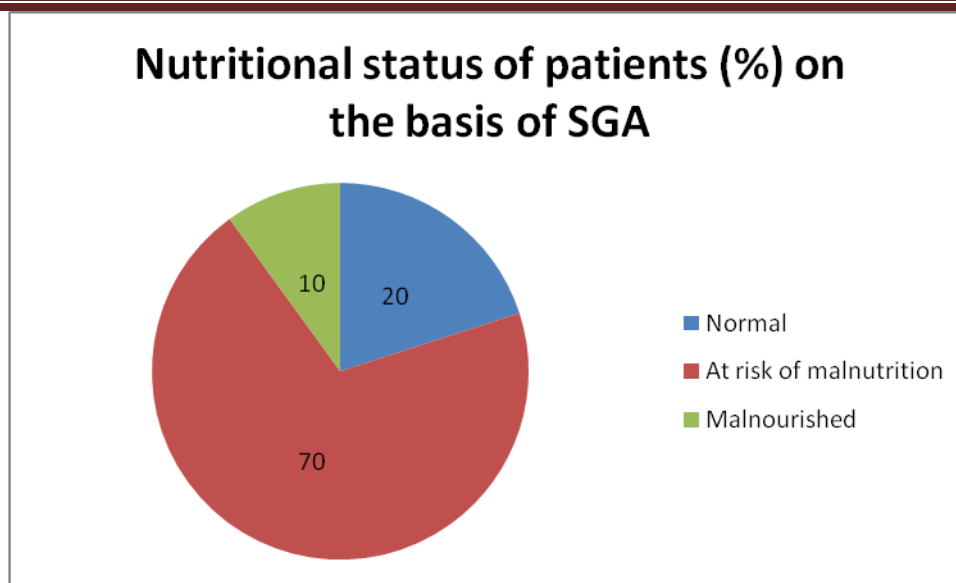
Table 8: 24 hrs mean food and nutrient intake of female cancer patients

Table 7 & table 8 are presenting the mean food & nutrient intake of male & female cancer patients who were undergoing chemotherapy. It is evident that mean nutrient intake of male patients was 1322 Kcal, 45.4 g, 249 g and 38.4 g for energy, protein, carbohydrate and fat respectively, while nutrient intake of female patients was 923 Kcal, 30.7 g protein, 169.5 g carbohydrate and 25 g fat. It is in consonance with the findings of Ravasco *et al.* (2003) who stated that reduced dietary intake was due to duration of disease, location of tumor, surgery as well as chemotherapy. When intake was compared to requirements (RDAs, 2020), it was found that males were 37.34% ( $p < 0.01$ ) deficit for energy, 15.9% deficit for protein ( $p < 0.05$ ), while females were consuming 44.39% less calories and 32.8% less intake of protein was recorded. On the other hand carbohydrate and fat consumption was above normal requirements.

## 8. Nutritional assessment as per Subjective global assessment tool

| Subjective Global Assessment Form                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <b>MEDICAL HISTORY</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |
| Patient name: _____ Date: ____/____/____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                      |
| <b>NUTRIENT INTAKE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |
| 1. <input type="checkbox"/> No change; adequate<br>2. Inadequate; duration of inadequate intake _____<br><input type="checkbox"/> Suboptimal solid diet <input type="checkbox"/> Full fluids or only oral nutrition supplements <input type="checkbox"/> Minimal intake, clear fluids or starvation<br>3. Nutrient intake in past 2 weeks*<br><input type="checkbox"/> Adequate <input type="checkbox"/> Improved but not adequate <input type="checkbox"/> No improvement or inadequate                                                                                                                                                                        |                      |
| <b>WEIGHT</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      |
| Usual weight _____                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Current weight _____ |
| 1. Non fluid weight change past 6 months<br><input type="checkbox"/> <5% loss or weight stability <input type="checkbox"/> 5-10% loss without stabilization or increase <input type="checkbox"/> >10% loss and ongoing<br>If above not known, has there been a subjective loss of weight during the past six months?<br><input type="checkbox"/> None or mild <input type="checkbox"/> Moderate <input type="checkbox"/> Severe<br>2. Weight change past 2 weeks* Amount (if known) _____<br><input type="checkbox"/> Increased <input type="checkbox"/> No change <input type="checkbox"/> Decreased                                                           |                      |
| <b>SYMPTOMS</b> (Experiencing symptoms affecting oral intake)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      |
| 1. <input type="checkbox"/> Pain on eating <input type="checkbox"/> Anorexia <input type="checkbox"/> Vomiting <input type="checkbox"/> Nausea <input type="checkbox"/> Dysphagia <input type="checkbox"/> Diarrhea<br><input type="checkbox"/> Dental problems <input type="checkbox"/> Feels full quickly <input type="checkbox"/> Constipation<br>2. <input type="checkbox"/> None <input type="checkbox"/> Intermittent/mild/few <input type="checkbox"/> Constant/severe/multiple<br>3. Symptoms in the past 2 weeks*<br><input type="checkbox"/> Resolution of symptoms <input type="checkbox"/> Improving <input type="checkbox"/> No change or worsened |                      |
| <b>FUNCTIONAL CAPACITY</b> (Fatigue and progressive loss of function)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      |
| 1. No dysfunction<br>2. Reduced capacity; duration of change _____<br><input type="checkbox"/> Difficulty with ambulation/normal activities <input type="checkbox"/> Bed/chair ridden<br>3. Functional Capacity in the past 2 weeks*<br><input type="checkbox"/> Improved <input type="checkbox"/> No change <input type="checkbox"/> Decrease                                                                                                                                                                                                                                                                                                                  |                      |
| <b>METABOLIC REQUIREMENT</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |
| High metabolic requirement <input type="checkbox"/> No <input type="checkbox"/> Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |
| <b>PHYSICAL EXAMINATION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                      |
| Loss of body fat <input type="checkbox"/> No <input type="checkbox"/> Mild/Moderate <input type="checkbox"/> Severe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |
| Loss of muscle mass <input type="checkbox"/> No <input type="checkbox"/> Mild/Moderate <input type="checkbox"/> Severe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |
| Presence of edema/ascites <input type="checkbox"/> No <input type="checkbox"/> Mild/Moderate <input type="checkbox"/> Severe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                      |
| <b>SGA RATING</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                      |
| <input type="checkbox"/> A Well-nourished Normal <input type="checkbox"/> B Mildly/moderately malnourished Some progressive nutritional loss <input type="checkbox"/> C Severely malnourished Evidence of wasting and progressive symptoms                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |
| <b>CONTRIBUTING FACTOR</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |
| <input type="checkbox"/> CACHEXIA - (fat and muscle wasting due to disease and inflammation) <input type="checkbox"/> SARCOPENIA - (reduced muscle mass and strength)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      |
| *See page 2 SGA Rating for more description.<br>April 2017                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                      |

Subjective global assessment (SGA) is a tool used to assess nutritional status of hospitalized patients that includes their anthropometry, biochemical profile, clinical examination and dietary intake. On the basis of SGA, ratings are given to patients as A (Normal/ healthy), B (At risk of malnutrition) & C (Malnourished).



Graph 1: Nutritional status of the patients

Graph 1 is depicting that 70% patients received SGA rating B that means – At risk of malnutrition, while 10% patients were malnourished (SGA rating C). Remaining 20% patients were found normal (SGA rating A).

### 9. Comparison of nutritional status with demographic data

It was found that patients who were malnourished, were between 55 – 60 years of age included both males and females. It is in very much similarity with the results of Kim 2019; Ravasco, 2019; Salas et al. 2017.

### 10. Comparison of nutritional status with lifestyle practices

When the data for lifestyle practices was compared to nutritional status of patients, it was noted that people who were found malnourished, were mostly those who were eating junk food most frequently or who had habits of smoking and alcohol as smoking and alcohol consumption led to decreased intake of nutritious meals. Simultaneously digestion and absorption of meals eaten was also altered due to these lifestyle related practices.

### 11. Comparison of nutritional status with type of cancer

Females suffering from breast cancer had normal food intake or high fat diet while lung cancer patients show good intake initially that deteriorated rapidly as they faced issues of breathing difficulty later on. Therefore majority of patients with cancers of breast, lungs, cervix showed nutritional status as normal while patients suffering from head and neck cancers or colorectal cancers or liver carcinoma presented their nutritional status in the category of at risk of malnutrition. This can be attributed to the

fact that tumor in mouth or gastro intestinal tract affected food intake drastically. Simultaneously chemotherapy also aggravated the situation in these patients due to the side effects of mucositis, oral ulcers, nausea, vomiting, constipation etc.

## Conclusion

From the present study, it can be concluded that male and female patients who underwent chemotherapy faced a lots of problems during chemotherapy that directly or indirectly influenced their nutrient intake. This led to a gap in fulfillment of their calorie and protein requirements when intake was compared to RDAs. Out of 50, 35 (70%) patients were found at risk of malnutrition, 5 (10%) patients were found to be malnourished and 20% patients were found normal in terms of nutritional status. Majority of malnourished patients were suffering from head and neck cancer followed by liver and colorectal cancer. It affected both male and female equally. Therefore further researches are required in the direction of planning suitable interventions to relieve patients from these side effects of chemotherapy and maintain their normal nutritional status.

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