

# ROLE OF PRE AND POST NUTRITIONAL INTERVENTION IN ESOPHAGEAL CARCINOMA

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## ABSTRACT:

**BACKGROUND:** Esophageal carcinoma is the fourth most type of cancer and keeps increasing in India affecting both men and women which keeps increasing every year. **AIM:** To evaluate and improve the Nutritional Status of the individual with Ca Esophagus through customized Diet plan and supplement. **OBJECTIVE:** To Assess the nutritional Status of patients with Ca Esophagus. To provide Customized Diet plan for patients at risk to improve the Overall Nutritional Status. **METHODS:** Patients who were diagnosed with Ca Esophagus were taken into study. Totally 30 Patients were taken during the study period of three months. **RESULTS :** The study concluded that the risk of Ca Esophagus were caused mainly due to the impact on poor nutritional status which was influenced by food intake, Improper food timing, Type of meal, social habits which resulted in severe weight loss, Longer therapy and extended hospital stay. **CONCLUSION:** It was observed that Individuals who had history in Consumption of Alcohol, Pan, tobacco Smoking, High salt food, Improper meal timing, Increased consumption of meat, Poor vegetable and fruit intake had risk of esophageal cancer, weight loss and increased hospital stay.

**Key Words:** Cancer, Esophagus, Nutrition, Food intake, Improve meal timing, Alcohol, Smoking.

## INTRODUCTION

**Esophageal carcinoma** is the eight type of cancer worldwide and fourth most type of cancer causing death in India. There is significant increase in Ca Esophagus worldwide. In India Esophageal Squamous cell Carcinoma (ESCC) is the common in Squamous cell carcinoma (SCC) [1]. Squamous cell carcinoma was responsible for more than 90% of esophageal carcinoma but now Adenocarcinoma is the major cause for esophageal cancer [2]. Forty seven thousand cases are approximately reported each year in India [3].

In India highest cases are reported in Assam, Kashmir, Tamil Nadu, Karnataka and Kerala [4]. People between the age group of 45-70, men over women, Black over white, Individuals who are heavy drinker, tobacco consumers, individuals who has history of GERD or Achalasia, individual who are obese or overweight are at high risk of Esophageal carcinoma [5]. According to Age Standardized Incidence rate (ASR) 6.5 percent per one lakh population in male and 4.2 percent per one lakh population in are affected by ESCC. It is been reported that Forty two thousand death every year is caused due to esophageal carcinoma.

The major nutrition related risk factor that cause ESCC include Poor nutritional status, Low intake of Fresh Fruits and Vegetables, Excessive intake of hot beverages, tobacco, alcohol consumption. Also Consumption of spicy foods, red chilies, high salt intake, and using of baking soda in cooking also causes esophageal carcinoma [6]. Other risk factors include Iron deficiency anemia, low riboflavin level, achalasia and tylosis [7].

Patients are usually diagnosed by Various methods which includes doing a barium swallow test which shows the lesion of the esophageal mucosa, endoscopy, Contrast Enhanced Computer Tomography (CECT), Endoscopic Ultrasound (EUD) , Positron Emission tomography (PET) are done [8]. Usually patients with Ca esophagus are put on NCRT or NACRT or surgically removing the affected part depending upon the stage of carcinoma .40-60 % of the Individuals who have had poor CRT tend to have tumor relapse within time frame of one year [9].

Patients with esophageal cancer are usually associated with malnutrition and impaired Nutritional intake. Hence Nutrition management plays an important role in recovering patients. The diet varies according to the type of therapy, stage of disease, weight loss percentage and symptoms. [10]. Enteral or Parenteral nutrition, Immunonutrient, oral supplement is usually recommended. Calorie and protein requirement are made according to individual requirement along with special nutritional needs for those who need special attention [11].

## Materials and Methods

Over thirty patients who were diagnosed with esophageal carcinoma were taken for the case series. The study was conducted in Tamil Nadu Govt Multi Super Specialty hospital, Chennai. All the Esophageal carcinoma patients were included in this study with no limiting age group. To Assess the nutritional Status of patients with Ca Esophagus. To provide Customized Diet plan for patients at risk to improve the Overall Nutritional Status. There were no inclusion and exclusion criteria. All the patients who were recently diagnosed with Ca esophagus were taken in this study. It is a Retrospective observation study and intervention was done only for those patients who had complaints of food intolerance and weight loss ranging from severe to moderate. From the day of admission till the day of discharge patient were assessed and followed up.

Various data such as Demographic data (Name, Age, Sex) , Anthropometric Data, biochemical data, Subjective Data, Social Habits, Past Medical History, Past Surgical History, Food Frequency, 24 Hour Recall Were Recorded from patients and cross check with the data in the case report/ case sheet. A detail Information on Food Frequency, Usual Home Routine intake, 24 hour recall re-call was obtained.

PG-SGA was used to assess the patient nutritional status Based on which a customized diet plan for each patient was given. Nutritional assessment were done using Patient-Generated Subjective Global Assessment (PG-SGA) tool. A study on comparison of various tools on cancer patients for a year done for one year done in china concluded saying PG-SGA is suitable tool for detecting the risk of malnutrition in patients with cancer [12]. Nutritional care plan was tailor made depending upon the BMI, Weight, and Weight loss percentage.

No participants were prospectively assigned to receive an intervention as they were receiving a customized diet as part of their clinical care. The survey was being used for observation and measurement, not to modify behavioral outcome. Upon improvement the biochemical data and PG-SGA was again assessed.

Over the observed patient the mean ( $\pm$  SD) age was 56.40 years  $\pm$  10.60. There was equal distribution in gender (50% male and 50% were female. The mean ( $\pm$  SD) height was 159.05cm  $\pm$  6.03cm and the mean ( $\pm$  SD) weight is 41.20kg  $\pm$  9.76kg. The mean ( $\pm$  SD) usual body weight of the patients were 52.9kg  $\pm$  7.86kg which shows that patient have had a weight loss which is the most common symptom of malignancy. The mean ( $\pm$  SD) BMI was 15.02kg/m<sup>2</sup>  $\pm$  3.77kg/m<sup>2</sup> which indicate patients were severely malnourished. The duration of weight loss varied from six month to one year. Mean ( $\pm$  SD) weight loss of 12.55  $\pm$  5.15 was observed in patients. Cachexia is major complication of cancer and increases the risk of morbidity and mortality in cancer patients. It is mainly due to anorexia, dysphagia and vomiting [13].

80% of the patient had no complaints of comorbidity. 20% which is two patient had diabetics mellitus, coronary artery disease, and cerebrovascular accident. None of the patient had previous history of surgery or family history. 70% had complaints of gastritis which is major cause of esophageal carcinoma. Data on social habits were collected from all patients without gender bias. It was observed that the entire male had more than one social habit. The duration ranged from minimum of two years to maximum of twenty years. 40% of the patient was smoker, 45% were alcoholic and 50% were pan chewer.

The most common symptoms of esophageal carcinoma are difficulty in swallowing, weight loss, dysphagia, vomiting, loss of appetite and indigestion. Among the Thirty patients 90% had complaints of vomiting, 40% has oral lesion, 90% had reduced food intake due to loss of appetite, and 10% had edema.

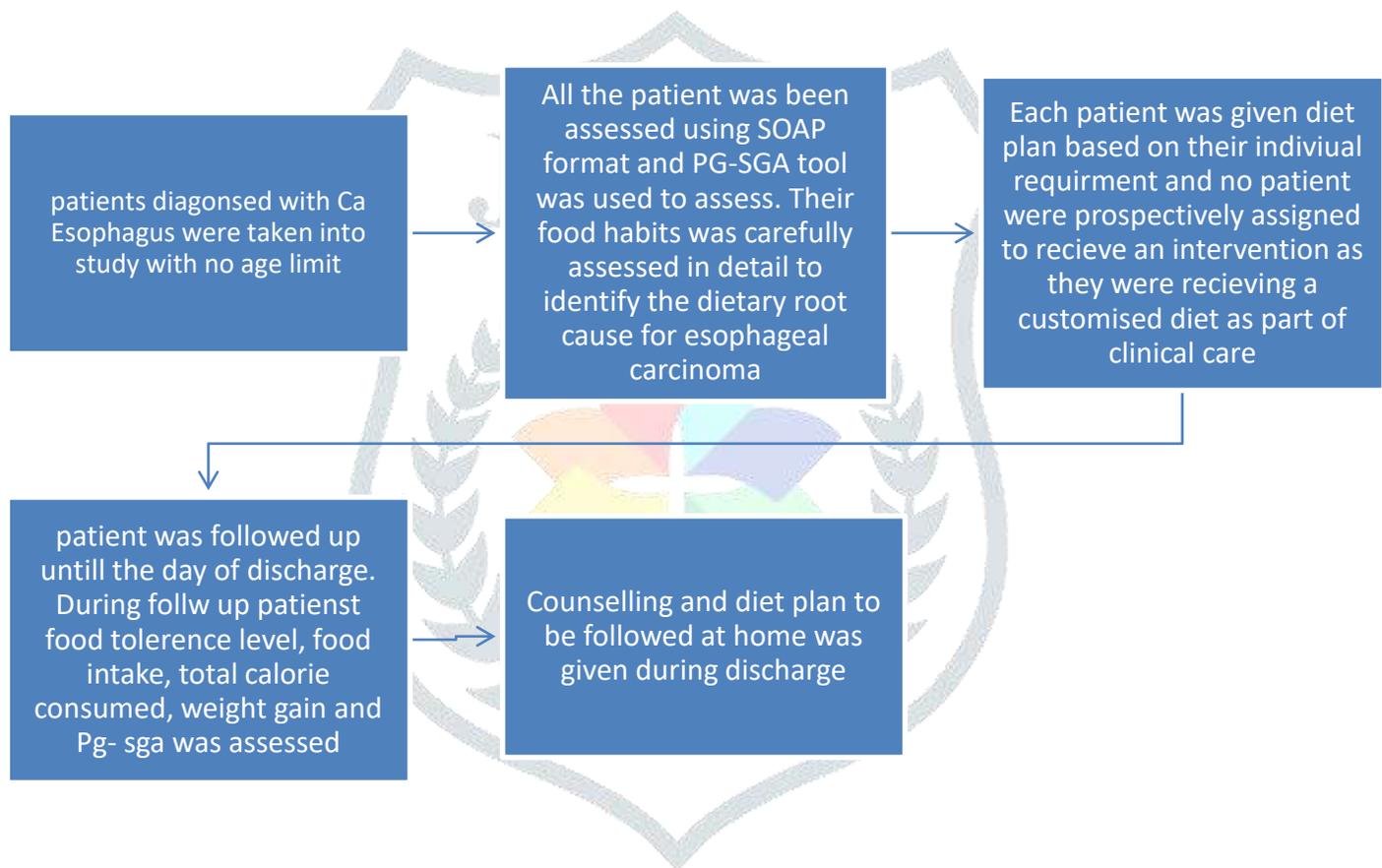
Nutritional assessment were done using Patient-Generated Subjective Global Assessment (PG-SGA) tool. PG-SGA has three categories. In this study 60% were under the category B and 40% were under the category C. Among the patients who had complaints of Due to dysphagia for solids 85% of the patients

were on liquid diet and 15% were on solid diet. 55% of the patients were on Ryle's tube and 45% were on oral diet among the once who had complaints of difficulty in swallowing.

Optimal nutrition after esophagectomy is challenging due to alterations in eating, both from the tumor and during surgical recovery. Enteral nutrition via feeding tube is commonly used. The hospital stay is shorter for the patients undergoing enteral feeding tube placement .

While assessing the food frequency it was ranged, such as Never- 0, daily-1, weekly twice-2, rare- 3 and mean was calculated it was found that fruits and vegetable were only consumed twice a week, but whereas spicy foods were consumed on a daily basis. This shows that spicy food has relationship with esophageal cancer. Usually cancer patient are treated depending upon the stage. In this study patients were on chemotherapy, Radiation therapy. For Patient who was in stage four surgeries were done and for some a combination of chemotherapy and procedure was done.

### Participant flow chart



### Results and Discussion

In this study various comparisons was done with the data's obtained. While comparing Age and Edema it was observed that 83.3 percent of the subjects had no complaints of edema. Though majority of the subjects didn't have major complaint of edema 16.7% had still had complaints and the most affected age group was 50-59years and 70-79years. The Difference was found to be statistically significance with subjects ( $P < 0.05$ ) Association of Age and Dysphagia shows that the age group between 50-79 years had dysphagia for solids (43.3%), 30% had combination of dysphagia (i.e. liquid and solid) and 20% had dysphagia for liquids. Thus there is statistical significance observed ( $P < 0.05$ ).

Association between Type of meal and dysphagia shows that Subjects who consume vegetarian meal had dysphagia for liquids(60%) and subjects who were non vegetarian had dysphagia for solids(48%)as well as combination (36%). Thus there was statistical significance seen in association between type of meal and dysphagia ( $P < 0.05$ ). Also it was observed that subjects who didn't consume vegetables had major complaints of dysphagia (80%), and subjects who consumes vegetables

daily has only dysphagia for liquids(60%). Thus There is statistical significance observed in association between Vegetable intake and dysphagia (P<0.05).

Table 1: Association between sex and smoking (N=30)

Sex	Smoker	Nonsmoker	P value
Male	66.7%	33.3%	0.00
Female	0	100%	

In this Study Majority of the males were smoker (66.7%) and only 33.3were under nonsmoking category. This shows there is direct relationship between smoking and risk of esophageal carcinoma. Thus the difference was found to be statistical significance ( P<0.05)

Table 2: Association between sex and alcohol (N=30)

Sex	Alcoholic	Nonalcoholic	P Vale
Male	93.3%	6.75	0.00
Female	0	100%	

In this study 93.3 percentages of the male subjects are chronic alcoholic and only 6.7% are non-alcoholic. While none of the female had social habit. Statistical significance was seen in association with sex and alcohol (p<0.05)

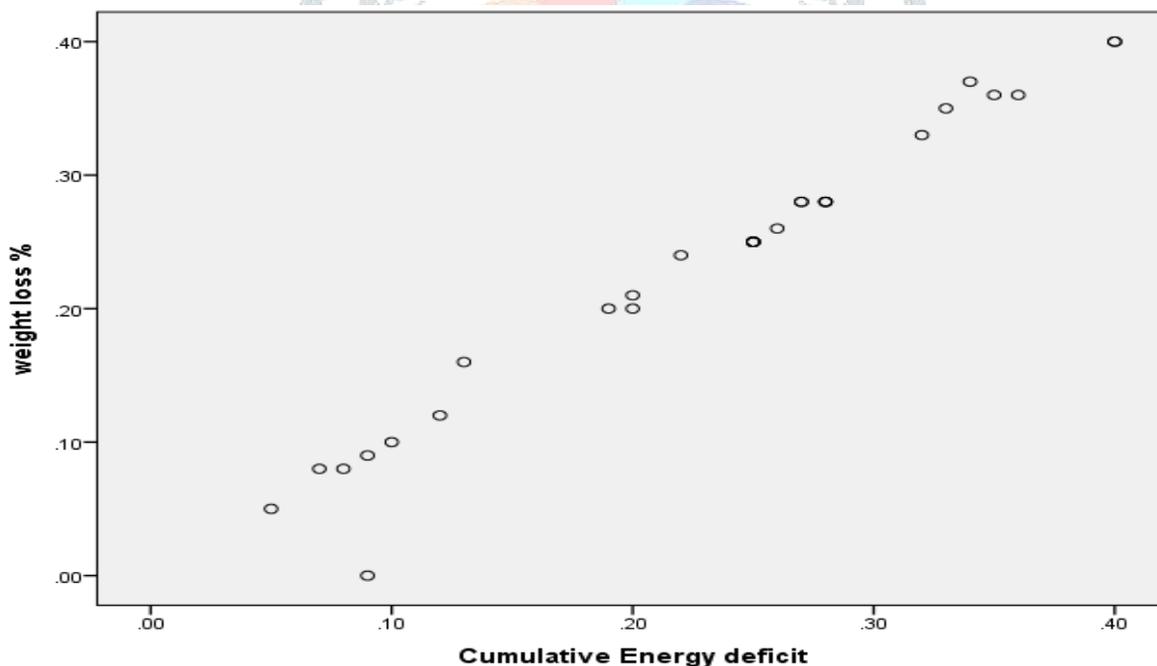


Figure 1: Association between cumulative energy deficit and weight loss (N=30)

The correlation between weight loss percentage and cumulative energy deficit was found to strongly positively correlate. The Pearson correlation co efficiency value was found to be 0.984.

## Nutrition Care Plan

Esophageal carcinoma usual hinders the appetite and aids in weight loss. While taking the home recall or 24 hour recall it was seen that the mean ( $\pm$  SD) calorie intake of the patient were only 998.65kcal  $\pm$  297.47 kcal per day and mean ( $\pm$  SD) protein intake was 37.15g  $\pm$  13.12g per day. While comparing with the requirement it observed that there was mean deficit of 52% in calorie and mean deficit of protein were 54%. Due with severe weight loss and malnourishment patient were given high calorie and high protein which in turn will help to recover from catabolic state. Mean ( $\pm$  SD) caloric requirement was 2517kcal  $\pm$  758 kcal and mean ( $\pm$  SD) protein requirement was 97g  $\pm$  24g was suggested to the patient.

## Conclusion

The mean age was 56 and gender was distributed equally among the thirty patient. All patient had severe weight loss and reduced intake due to dysphagia. Food frequency shows that most of the patient consumes fruits and vegetables only twice a week, but spice was part of their daily diet. Thus there is relationship between spicy food and esophageal carcinoma. Patient who were on enteral feed pre operatively had reduced length of hospital stay and had no post-operative complication such as leak. A high calorie and high protein diet improves the patients weight, reduced the length of stay, decreases the complications and moves the patient from catabolic state to anabolic state. Thus nutrition plays a major role in recovering carcinoma patient.

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