

Association of Dietary Patterns with Carcinoma Oesophagus in Jammu region, J&K, India

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Abstract : The esophagus is one of the common site of malignancy in the gastro-intestinal tract. Oesophageal cancer is the sixth leading cause of cancer-related deaths worldwide owing to its aggressive nature & late and poor prognosis. Its incidence has increased substantially in the last three decades. This increase may be largely attributed to the changing lifestyles of the people. The exact cause of oesophageal cancer is still not known, yet there are some of the causative factors which have been implicated in the etiology of carcinoma oesophagus. Thus, the present study on 148 patients, hailing from Jammu region (J&K state) suffering with carcinoma oesophagus was carried on with the aim to determine the risk factors associated with carcinoma oesophagus in this region.

Key words : Oesophageal, Carcinoma, Food pipe cancer, Jammu.

1. Introduction

The oesophagus is one of the common site of malignancy in the gastro-intestinal tract. All the malignant cancers arising in the wall of oesophagus or food pipe are called oesophageal cancer/carcinoma oesophagus. Due to its aggressive nature and high mortality rate oesophageal cancer is the deadliest cancer worldwide (Karamanou *et al.*, 2017). It is also a global health issue as it is the sixth leading cause of cancer-related deaths, owing to its late and poor prognosis (Ribeiro *et al.*, 1998 and Kollarova *et al.*, 2007).

In Asiatic countries its incidence has increased substantially in the last three decades (Pohl *et al.*, 2010). This increase may be largely attributed to the changing lifestyles of the people. In India, the incidence of oesophageal cancer is moderately high. It is the second most common cancer among males and the fourth most common cancer among females. It is the disease of the adults and starts with Dysphagia as its major clinical symptom.

Several factors including dietary deficiencies or exposure to environmental carcinogens have been implicated in its etiology (Chang *et al.*, 1992; Tavani *et al.*, 1993; Stemmermann *et al.*, 1994; Thomson *et al.*, 1999; Bosetti *et al.*, 2000; Levi *et al.*, 2000; Pfau & Marquardt, 2001; Galeone *et al.*, 2005; Gallus & La Vecchia *et al.*, 2006; Ocama *et al.*, 2008; Wiseman *et al.*, 2008; Islami *et al.*, 2009; Ibiebele *et al.*, 2010; Sewram *et al.*, 2014; Munishi *et al.*, 2015; Okello *et al.*, 2016 and Middleton *et al.*, 2019).

The exact cause of Oesophageal cancer is still not known, yet there are some of the causative factors which have been implicated in the etiology of carcinoma oesophagus. The present study provides evaluations of the role of dietary patterns and oesophageal carcinoma risk.

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2. Material and Method

The present study is based upon the survey, conducted through a structured questionnaire on 148 patients hailing from different parts of the Jammu region suffering from carcinoma oesophagus. The questionnaire dealt with some of the dietary factors which may be contributing to the development of carcinoma oesophagus.

3. Results and Discussion

Age: Age and gender play a significant role in carcinoma oesophagus as it effects a particular age group and a particular gender in higher frequency. During the present study it was observed that the incidence of oesophageal cancer is more in the age group of 50-60 yrs. (Fig., 1). which shows that the people of a particular age group are more susceptible to the disease. Moreover, males of the above age group are mostly diagnosed with it (Fig., 2) (Wynder & Gori, 1977; Paul & Scott, 1988; Ribeiro et al, 1998 and Kolarova et al, 2007; Chasimpha et al., 2017; Klingelhöfer et al, 2019).

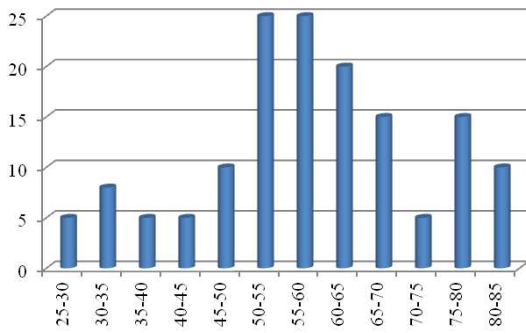


Fig. 1: No. of Patients in each group

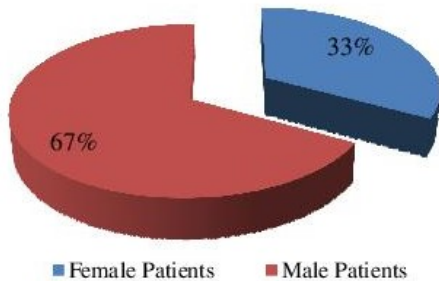


Fig. 2: Percentage of carcinoma oesophagus in both sexes

Role of Diet : There exists a close association between the different types of diet, its quality and the development of oesophageal cancer (Sewram et al., 2014). Increasing evidences

highlight the crucial role of dietary components in inducing or modifying carcinogenic process (Reszka et al., 2006). The food that we eat can affect the development of carcinoma oesophagus. This diet may be in the form of smoking, nutritional deficiency, consumption of hot beverages etc (Gallus & La Vecchia, 2006 and Ibiebele et al., 2010).

Spicy & oily Food: In the present study it was observed that the people who are in the habit of eating deep fried, oily and spicy food.(Fig., 3) were more prone to this disease.

Spices nowadays are usually found to be adulterated with different toxic elements & also stimulate the secretion of gastric juices causing reflux oesophagitis (Swaminathan, 1985).

Moreover, cooking medium modifies the genotoxic effects of the known clastogens (Dutta et al., 1985). Vit E is the major ingredient of oil, which has antioxidant properties but cooking at high temperatures has denaturing effect on it (Tuyns et al.,1978; Barone et al.,1992; Gao et al., 1994; Launoy et al., 1998; Bosetti et al., 2000; Pfau & Marquardt, 2001; Galeone et al., 2005 and Ibiebele et al., 2010).

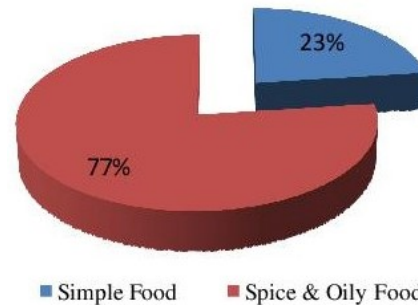


Fig. 3: Percentage of carcinoma oesophagus in patients having simple and spicy food

Non Vegetarian food : This study also points out that there is an association between meat (especially red meat and the processed meat) intake and the risk of oesophageal cancer (Fig., 4).

Meats cooked at high temperatures (i.e., frying and grilling) and for a long duration contain heterocyclic amines (HCAs) and polycyclic aromatic hydrocarbons (PAHs) which are, potent mutagens (Ames, 1983; Ward et al., 1997; Thomson., 1999; Bosetti et al., 2000; Zheng & Lee, 2009; Ai Kubo et al.,

2010; Sewram *et al.*, 2014). The extent of their formation depends upon on the cooking temperature and the method of cooking and preservation (Doolittle *et al.*, 1989; Chang *et al.*, 1992; Thomson, 1999; Pfau and Marquardt, 2001; Dai *et al.*, 2002 and Gallus and La Vecchia, 2006).

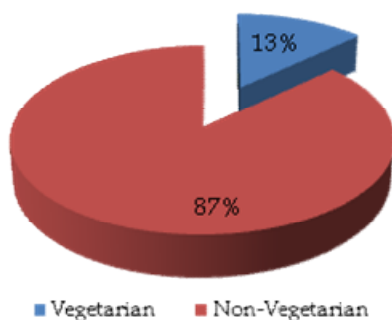


Fig. 4: Percentage of carcinoma oesophagus in vegetarian and non-vegetarian

Meats cooked at high temperatures (i.e., frying and grilling) and for a long duration contain heterocyclic amines (HCAs) and polycyclic aromatic hydrocarbons (PAHs) which are, potent mutagens (Ames, 1983; Ward *et al.*, 1997; Thomson., 1999; Bosetti *et al.*, 2000; Zheng & Lee, 2009; Ai Kubo *et al.*, 2010; Sewram *et al.*, 2014). The extent of their formation depends upon on the cooking temperature and the method of cooking and preservation (Doolittle *et al.*, 1989; Chang *et al.*, 1992; Thomson, 1999; Pfau and Marquardt, 2001; Dai *et al.*, 2002; Gallus and La Vecchia, 2006).

Hot beverages: Further risk factors of oesophageal carcinoma are the consumption of very hot liquids (Islami *et al.*, 2009; Munishi *et al.*, 2015; Middleton *et al.*, 2019). The study also depicted that most of the sufferers were in a habit of consuming hot beverages (Fig., 5).

Long term exposure to hot beverages like tea, coffee etc. cause damage to the oesophageal lining of the oesophagus. Moreover tea is the major provider of theobromines and certain alkaloids which are potent carcinogens, mutagens and teratogens. Tea also has caffeine in it which interferes with the DNA repair mechanism (Hormozdiari *et al.*, 1975; Clarke, 1982; Chang *et al.*, 1992; Dai *et al.*, 2002; Sewram *et al.*, 2003; Kollarova *et al.*, 2007 and Ibiebele *et al.*, 2010)

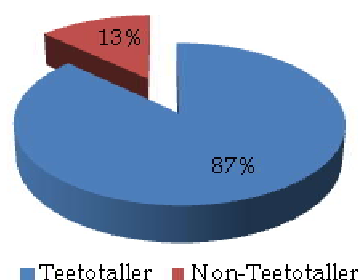


Fig. 5: Percentage of carcinoma oesophagus in teetotaler and non-teetotaler

Smoking : The survey also pinpoints towards smoking as one of the factors related with the development of Ca Oesophagus.(Fig., 6).

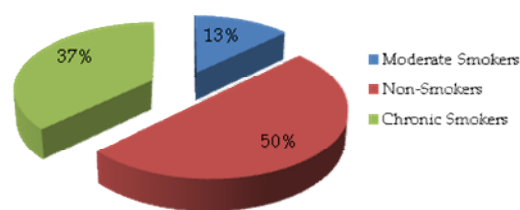


Fig. 6: Percentage of carcinoma oesophagus in Smokers and Non-Smokers

The use of tobacco in any form can increase the risk of developing carcinoma oesophagus (Ocamo *et al.*, 2008; Wiseman *et al.*, 2008; Asombung *et al.*, 2016; Okello *et al.*, 2016). Smoking impairs folate status, and other methyl-related nutrients e.g., vitamin B6, vitamin B12, and methionine (Ai Kubo *et al.*, 2010; Bailey, 2003) which also has some impact on the development or the progression of the disease.

Conclusions

The findings of the present study and the meta-analysis of the available literature clearly suggest that the changing lifestyle and the dietary patterns of the people may act early in the carcinogenic pathway. But at the same time the risk factors discussed here, imply that a healthy and balanced diet emphasizing more on fruits and vegetables lead to a reduced risk of carcinoma oesophagus.

In short, oesophageal carcinoma being a multistep process has a multifactorial etiology too. Some factors are important in the initiation of the neoplastic state, while others help in the promotion and

progression of the disease. Thus, oesophageal carcinoma may result from the synergistic action between some or many of these etiologic factors, yet it is too early to depict any one of them to be responsible for its causation still further research is still required to understand the risk factors.

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