IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 14, Issue 6 Ver. VI (Jun. 2015), PP 49-55
www.iosrjournals.org

Lifestyle, Eating Pattern and Comorbidities among Colorectal Cancer Patients Undergoing Cancer Therapies

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Abstract: *Colorectal cancer is one of the most common types of cancer in the world. The relationship between lifestyle pattern and colorectal cancer has been extensively studied over past two decades. Several lifestyle factors affect colorectal cancer carcinogenesis in a complex way. Comorbidities during cancer also play a very important role in cancer survival. The aim of the present study is to understand the lifestyle, eating behaviors, complications and comorbidities faced by the cancer patients while undergoing standard cancer treatments. A systematic investigation using a well formulated tool, a study was carried out among 80colorectal cancer patients to understand their lifestyle, eating behaviors and comorbidities during the treatment. The results revealed that most of the patients were physically inactive, had smoking and drinking habits and faced several complications during the therapies.*

Keywords: *Colorectal cancer (CRC), Comorbidities, Complications, Eating pattern, Lifestyle.*

I. Introduction

Cancer of the colon and rectum is a major health problem worldwide, and, it is one of the most prevalent malignancies [1].Colorectal cancer is the third most common cancer in men (746,000 cases, 10.0% of the total) and second in women (614,000 cases, 9.2% of the total) worldwide. Almost 55% of the cases occur in more developed regions. There is wide geographical variation in incidence across the world and the geographical patterns are very similar in men and women: incidence rates vary ten-fold in both sexes worldwide, the highest estimated rates being in Australia/New Zealand (ASR 44.8 and 32.2 per 100,000 in men and women respectively), and the lowest in Western Africa (4.5 and 3.8 per 100,000) [2].The burden of CRC has risen rapidly in some economically developed Asian countries like Japan, South Korea and Singapore. Fortunately, the age adjusted incidence rates of Colorectal Cancer (CRC) in all the Indian cancer registries are very close to the lowest rates in the world [3].Colorectal cancer occurs more frequently in the elderly; prognosis in the young is poor. Ninety five per cent of tumors begin with the development of a benign, adenomatous polyp in the large bowel or rectum and most tumors are adenocarcinomas [4].

The specific cause for colon and rectal cancers are unknown. Epidemiologic evidence links behavioral/lifestyle factors to a variety of malignancies, including the most common cancers diagnosed in the developed world – lung, colorectal, prostate, and breast cancer [5].There are several interrelated risk factors under investigation. Both heredity and mainly, environmental factors like potential carcinogens and mutagens present in the diet, alcohol, tobacco and physical activity contribute to the development of colorectal cancer [6].Lifestyle factors can influence the rate of cancer progression, improve quality of life (QoL), reduce side-effects and risks during treatment, reduce the incidence of relapse, and improve overall survival [7]. Comorbidity also composes a great challenge for patients with colorectal cancer as they can influence the treatment and their outcomes. Comorbid diseases are defined as those life shortening diseases present at the time of CRC diagnosis [8].A lifestyle can always influence comorbid conditions because a healthy lifestyle can improve quality of life and reduce the risk of developing new diseases. Surgical removal of polyps, chemotherapy, radiation or biological therapies are the standard treatment procedures used for the management of CRC.Sometimes two or more forms of treatments are combined.All individuals with colorectal cancer suffer various physical side effects such as nausea, vomiting, weight loss, and hair loss, loss of appetite, mouth sores, diarrhea, fatigue, infection or bleeding while undergoing treatment. The treatments are dictated based on the size, location, and extent of the tumor and the patient's general health [9].

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Nowadays anyone can develop cancer and recent times have seen an increase in the incidence of cancer. However it is estimated that more than half of all new cancers and cancer deaths worldwide are potentially preventable [10]. There is now persuasive evidence that a healthy lifestyle during and after cancer is associated with improved physical and psychological well-being, reduced risks of treatment, enhanced self-esteem, reduced risk of recurrence, and improved survival[11]. Lifestyle factors and eating behaviors impact cancer risk and that positive, population wide changes can significantly reduce the cancer burden and improve quality of life [12]. Apart from this, understanding the role of comorbidity in cancer is also important as it has a substantial impact on cancer survival. So the present study aimed to determine these lifestyle, eating patterns, complications and comorbidities faced by the cancer patients while undergoing treatment as the health and well-being of the cancer patients should start with behavioral risk factors by tackling the biggest lifestyle influences [13].

II. Materials And Methods

Eighty colorectal cancer patients between the age group 35-65 years undergoing conventional cancer therapies at Amala Cancer Centre, Thrissur and Medical College Hospital, Kozhikode were selected randomly. The respondents were interviewed personally using interview schedules about their lifestyle, eating pattern, complications and comorbidities faced by them while undergoing therapy. Ethical guidelines for biomedical research on human subjects as per Helsinki Declaration were observed during the course of preparation of schedules and data collection. The collected data were analyzed and evaluated.

III. Results And Discussion

Eighty colorectal cancer patients, 50 males and 30 females undergoing conventional cancer therapies were studied to understand their lifestyle, complications and comorbidities during treatment. The respondents were suggested for various kinds of conventional treatments like chemotherapy, radiation or both for better outcomes. 51 per cent of the subjects were undergoing chemotherapy for cancer, whereas 35 per cent radiation therapy and 14 per cent both, chemo and radiation therapy as their treatment regimen.

Table1: Type of treatment undergone by the patients

Criteria	Frequency (N=80)	Per cent of subjects (%)
Chemotherapy	41	51
Radiation therapy	28	35
Chemo and Radiation therapy	11	14
Total	80	100

The management of CRC is multimodal and optimum therapy is determined by the tumour stage. Chemotherapy regimens have been widely adopted in clinical practice as response rates and overall survival has been further improved. This is one of the best optional treatments done to cure colorectal cancer compared to radiation therapy which is likely to cause many side effects [14]. Among the eighty subjects, 37 per cent each of the respondents were diagnosed with CRC for less than or equal to one to two years while 26 per cent for more than 2 years. Disease duration is perhaps the best established risk factor for colon cancer such that the severity and the chronic inflammatory process promotes colon carcinogenesis and can affect overall quality of life of the subjects [15].

3.1. Life style pattern of colorectal cancer patients

The life style patterns of 80 colorectal cancer patients were analyzed to view whether any of these factors were a contributing cause towards colorectal cancer. The relationship between lifestyle pattern and colorectal cancer has been extensively studied over past two decades. Physical activity, smoking, alcohol consumption and betel leaves chewing by the respondents were studied as part of their lifestyle.

3.1.1. Physical activity of CRC patients

Globally, inactivity causes close to 2 million deaths each year [5]. It is linked to most major chronic diseases, including type II diabetes, osteoporosis, stroke, cardiovascular disease, and cancer. All the patients were asked about their physical activity and the results are presented in Fig 1.

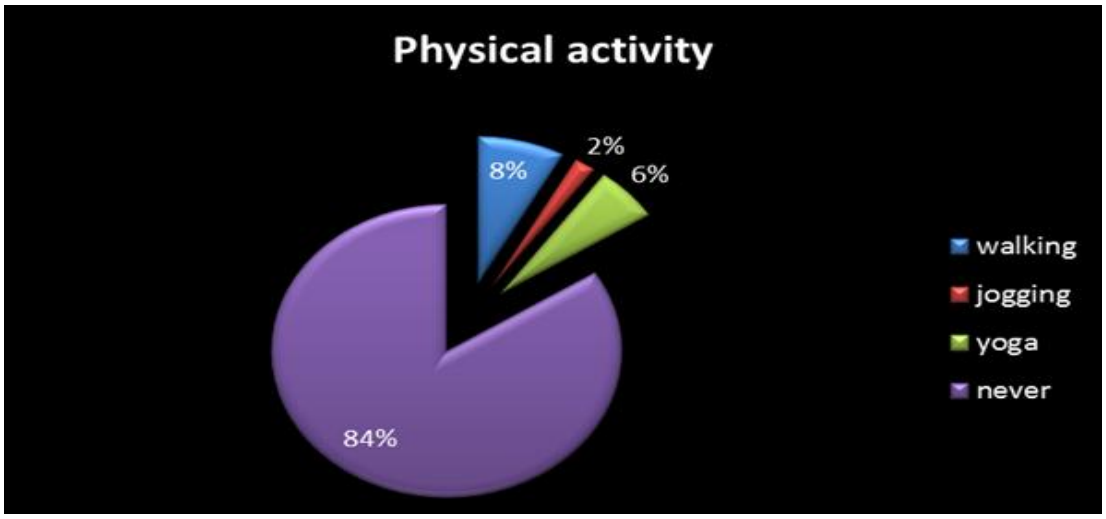

Figure 1: Physical activity of colorectal cancer patients

Regarding the physical activity, only a very few percentage of the respondents (16 per cent) did physical activity daily, where 8 per cent did walking, 2 per cent did jogging and 6 per cent practiced yoga. 84 per cent of the respondents abstained from any form of physical activity. Among the subjects who exercised, 69 per cent of respondents did exercise for 30 minutes, 23 per cent for 45 minutes and 7 per cent for 1 hour daily. Majority of the subjects didn't do exercise because of the extreme tiredness and fatigue owing to the treatment. The American Cancer Society recommends engaging in at least moderate physical activity for 30 minutes or more on 5 or more days per week. 45 to 60 minutes of intentional physical activity is preferable. Research strongly suggests that exercise is not only safe during cancer treatment, but it can also improve physical functioning and many aspects of quality of life [10]. Moderate exercise has been shown to improve extreme tiredness, anxiety and self-esteem. Increased physical activity is linked to 40 per cent reduction in colon cancer and that 13 per cent to 14 per cent of colon cancers can be attributed to physical inactivity. Current research evidence suggests that physical activity may not only prevent certain cancers from occurring but may also help individuals manage some of the difficulties related to cancer treatments (e.g., physical side effects, poorer quality of life) or help individuals improve their health following treatment for cancer [16].There is a wealth of evidence for physical activity during and after treatment, improving symptoms of cancer-related fatigue, and increasing energy and stamina [17].

3.1.2 Smoking, alcohol consumption and betel leaves usage among the subjects.

Personal habits of the subjects like smoking, alcohol consumption and betel leaves chewing are depicted in Fig 2. Researches have shown relationships between cancer and cigarette smoking, alcohol and betel leaves. The link is primarily due to the fact that they contain thousands of chemicals including many known to be carcinogens and tumour promoters.

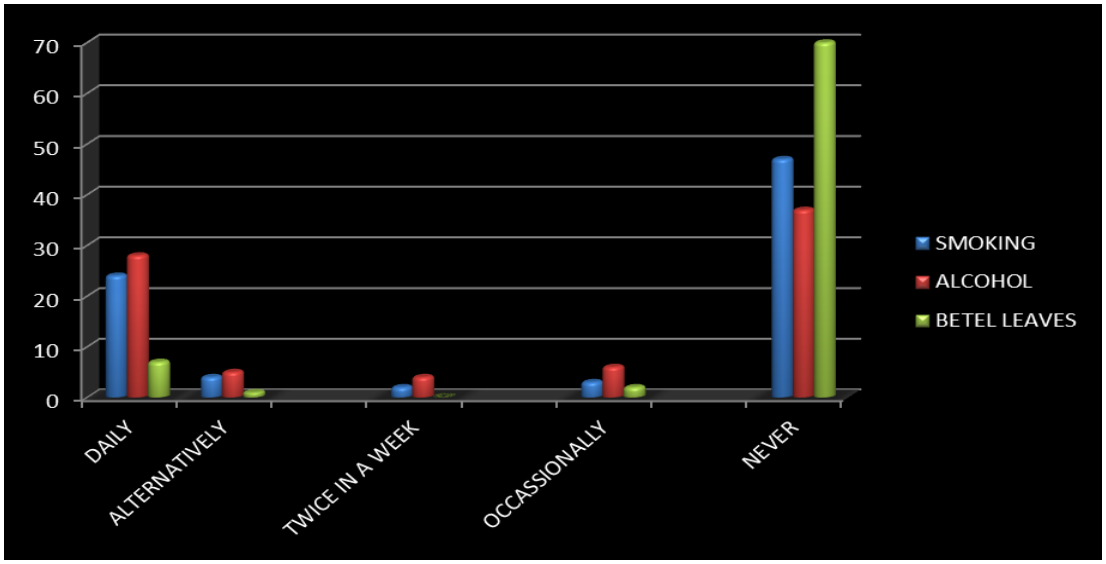

Figure 2: Smoking, alcohol consumption and betel leaves usage among the subjects.

Personal habits such as smoking, alcohol consumption and betel leaves chewing have been clearly presented. In the Fig it can be understood that 24 per cent of the respondents smoked daily, 28 per cent consumed alcohol and 7 per cent chewed betel leaves daily. However 47 per cent of the respondents abstained from use of alcohol, 37 per cent from smoking and 70 per cent from chewing betel leaves. Smoking and regular consumption of alcohol may be associated with increased risk of developing colorectal cancer. Alcohol consumption is a factor in the onset of colorectal cancer at younger age [18].

According to American Cancer Society (ACS) [19], epidemiologic studies show a direct relationship between beer consumption and rectal cancer. The ACS recommends no more than two drinks per day for men and one drink per day for women. Colorectal cancer has been linked to even moderate alcohol use. Individuals who have a lifetime average of 2 to 4 alcoholic drinks per day have a 23 per cent higher risk of colorectal cancer than those who consume less than one drink per day.

3.2. Complications faced by the respondents undergoing therapy

Colorectal cancer and its treatment can significantly affect an individual's physical well-being as they face a lot of problems like weight loss, nausea, dislike for food, diarrhoea, loss of appetite which can in turn affect their treatment efficacy, nutritional status, and quality of life.

3.2.1 Duration of sleep

Table 2: Duration of sleep of CRC patients

Criteria	Category	Frequency(N=80)	Per cent of subjects (%)
Duration of sleep	a. Less than 4 hours	20	25
	b. Between 4-6 hours	60	75
	c. Between 6-8 hours	-	-
Total		80	100

Majority (75 per cent) of the subjects slept for 4-6 hours daily and 25 per cent slept less than 4 hours. An adult should get at least 6-8 hours of sleep daily. It is evident from the TABLE that most of the subjects did not get enough sleep. Cancer and cancer treatments are associated with alterations in the immunological functions which in turn are associated with changes in sleep pattern. Pain is particularly problematic in cancer treatments affecting up to 80 per cent of the patients, the majority of those with significant pain report is disruptive to sleep [20].

3.2.2. Changes in weight of the respondents.

Colorectal cancer generally causes the following three basic systemic effects which include: anorexia or loss of appetite resulting in poor food intake, increased metabolism resulting in increased nutrient and energy needs, negative nitrogen balance- resulting in more catabolism or breaking down of body tissues. So these can pose fluctuations in the weight which might result in unintentional weight loss and wasting.

Table 3: Changes in weight

Criteria	Frequency (N=80)	Per cent of subjects (%)
Decreased	77	96
Increased	1	1
Not changed	2	3
Total	80	100

Ninety six per cent of the colorectal cancer patients lost weight during the course of treatments. One of the most common problem experienced by colorectal cancer patients are unintentional weight loss, which leads to malnutrition, increased susceptibility to infections, reduced quality of life, and shorter survival time. The underlying causes of unintentional weight loss in cancer patients may be attributed to a variety of causes including loss of appetite associated with chemotherapy and/or radiation therapy and psychological disturbances such as depression which has found to affect majority of cancer patients. A net loss in weight occurs when the body uses more calories from stored energy reserves than is available from calories ingested from nutrients in

the diet. Metabolic changes in cancer can also cause a condition called cachexia- a generalized wasting condition involving the loss of muscle mass and fat [21].

3.2.3 Food intake during therapy

The self-reported food intake of the respondents during therapy showed that the respondents had a less than usual food intake (97 per cent) compared to that of their normal food intake. And the food consumption pattern revealed that majority (85 per cent) of the respondents took normal food but less than normal amount. Five per cent of the respondents were able to take solid foods and 6 per cent of them took only liquid foods.

Table 4: Food intake during therapy

Criteria	Categories	Frequency (N=80)	Per cent of subjects (%)
Food intake	Unchanged	2	3
	More than usual	-	-
	Less than usual	78	97
	Total	80	100
Food consumption pattern	a) Normal food but less than normal amount	68	85
	b) Little solid food	4	5
	c) Only liquids	5	6
	d) Very little of anything	3	4
	Total	80	100
Symptoms	a) No eating problems	5	7
	b) No appetite, mouth sores, things taste funny, problems swallowing, vomiting	57	71
	c) No appetite, mouth sores, nausea, constipation, problems swallowing,	9	11
	d) No appetite, mouth sores, nausea, diarrhoea, problems swallowing	9	11
	Total	80	100

Seventy one per cent of the colorectal cancer patients complained of no appetite, mouth sores, funny taste, vomiting and problem swallowing. The TABLE also revealed that 11 per cent each of the respondents had no appetite, mouth sores, nausea, constipation/ diarrhoea and problems swallowing. None of the respondents took any vitamin supplementation during the therapy. Chemotherapy and radiation cause several physical side effects, such as nausea, vomiting, hair loss, mouth sores, diarrhoea, fatigue, infection, difficulty swallowing, skin changes or bleeding. What is known is that all individuals with colorectal cancer may suffer physical effects while undergoing treatment. These side effects or symptoms ultimately can negatively affect quality of life [1]. These can lead to failure to eat regularly; poor food choices, self-imposed diets, inappropriately rigid diet prescriptions, mistaken food beliefs, and a distorted body image are among many factors that contribute to poor food intake and deterioration of nutritional status.

3.2.4. Function and activities of the cancer patients

Most (56 per cent) of the colorectal cancer patients rated their functions and activities as normal with no limited actions, followed by 16 per cent of the respondents able to do little activity. 9 per cent and 6 per cent of the respondents were pretty much bed ridden and no feelings up to most of the things. Moderate physical activity such as walking on a treadmill, cycling, light weights, relaxation techniques and stretching exercise can help maintain physical function, combat fatigue, and decrease nausea, and neuropathy in the short term. In the long term, it can diminish consequences of cancer treatments [22].

3.3 Comorbidities in cancer patients undergoing therapy

Comorbidity is the co-existence of diseases or disorders in addition to a primary disease of interest. It has detrimental effect on cancer survival. Data were collected on all major comorbid conditions present in the respondents during the therapy.

Table 5: Comorbidities among cancer patients

Sl no	Signs	Onset of disease			Total	
		Less than 1 year	1-5 years	5-10 years	Frequency (N=80)	Per cent of subjects (%)
1.	Anaemia	68	4	-	72	90
2.	Diabetes	-	-	38	38	48
3.	Diabetes and cholesterol	-	-	10	10	13
4.	Diabetes, cholesterol and hypertension	2	-	7	9	11
5.	Other cardio vascular diseases	-	-	2	2	3
6.	Diabetes cholesterol and liver problems	-	-	13	13	16

Ninety per cent of the patients had at least one comorbid condition and a quarter had three or more. The most common conditions were anemia (90%), diabetes (48%) and cardiovascular problems. Majority of the respondents were diagnosed with anemia with less than a year due to loss of blood by rectal bleeding. 48 per cent of the subjects were diagnosed with diabetes over 5 years and 13 per cent have both diabetes and cholesterol. 3 per cent of the subject had cardio vascular diseases and 16 per cent had diabetes, cholesterol and liver diseases.As more than half of patients with CRC are aged older than 70 years, the diagnosis of CRC is often made amidst the presence of other chronic medical conditions. Treatment of patients with severe comorbidity is challenging because of polypharmacy and decreased compensating mechanisms, especially in older patients who also have normal age-related physiological changes [23]. Besides the beneficial effect on recurrence, a healthy diet and regular physical activity has the potential to reduce the risk of co-morbidity, such as other cancers, cardiovascular disease, and diabetes, etc. [24].

IV. Conclusion

In the present study "Lifestyle, eating pattern and comorbities among colorectal cancer patients undergoing cancer therapies" was carried out to evaluate the lifestyle, eating pattern, complications and comorbidities among cancer patients. Colorectal cancer is the cancer of the old and 'Lifestyle' refers to personal choices that might impact health, such as diet, physical activity, smoking, and alcohol consumption. Although many cancer survivors report making healthy lifestyle changes after diagnosis, they are often temporary. From the study it was clear those patients even though while under treatment, chose faulty lifestyle habits and faced complications during treatment. Interests must be paid to the role of these behavioral risk factors and the role of lifestyle in improving or maintaining health, preventing illness, managing symptoms, and achieving a satisfactory quality of life. However, to bring about dramatic reductions in cancer incidence, widespread lifestyle changes are necessary. So attempts must be made to promote certain challenging and innovative ways to modify lifestyle and reduce problems faced by the subjects. Understanding the role of comorbidity in cancer also has a substantial impact on survival. So it is necessary to keep these in mind for the better wellbeing of the patients because all the above mentioned parameters play a part in cancer survival.

V. Acknowledgement

The authors hereby acknowledge Dr Abdullah Al Anazi, Dean of College of Applied Medical Sciences and Dr Nasrin Abdul Rahman Al Harty, Assoc.Dean of College of Applied Medical Sciences, King Saud Bin Abdul Aziz University for Health Sciences, KSA for the support provided.

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