Socio-demographic and majordietary habitsinduced colorectal cancer in some Egyptian's patients

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Abstract

Colorectal carcinoma (CRC) is the third most common cancer in the world. The incidence of CRC in Egypt comprises 4.4% of all malignant tumors.CRC is more prevalent in the countries that have an occidental type diet (rich in meat, animal fat, and refined carbohydrates and poor in fibre). Several geographic areas are suffering a growing rise in incidence that seems to be related to a greater local prosperity and a concomitant occidentalization of their diet.The study aimed to discuss major dietary habits that might be induced colorectal carcinoma in Egypt.Results indicated that, the majority of patients were classified as moderate class, represents 70%.Regarding foods promoted colorectal cancer, high percentage (75%) of CRC patients habituated to eat fast foods. The consumption from smoked and/or salted meats was the highest (52.50%) among studied groups. Moreover, 55% of CRC patients used to eat salted cheese daily, while 45% were consumed salted meats or cheese irregularly. With respect to adipose tissue and fat food content, the highest percent (55%) of patients did not remove poultry skin or adipose fat from meats. Furthermore, most of them drank whole milk and cream where it was 82.50% of patients.As regard benefit and protective foods, only 12.50% of patients used to eat whole grains daily, while 60% did not eat it absolutely, 27.50% only of patients used to eat fresh fruits and vegetables or salad daily. Otherwise, more than half of patients did not drink water regularly.

Introduction

Globally, colorectal carcinoma (CRC) is the third most common cancer in the world, contributing 8.9% of all cancers **(SEER, 2007)**. In USA colorectal cancer constitutes 9.5% of all cancers, whereas, in Egypt it contributes 6.5% of all cancers **(El-Bolkainy, 2005).** The incidence of CRC in Egypt according to **Bafandeh***et al.,* **(2008)** comprises 4.4% of all malignant tumors.The association between diet and colorectal cancer has been studied in depth for many decades, with equivocal results. **Jacobs** *et al.,* **(2007)** hypothesized that cancers arising in the distal and proximal colon have different pathologies, and therefore different risk factors. As such, it is possible that diet-related factors might influence colorectal neoplasia differently depending on the subsite. Furthermore, nutritional risk screening may be able to predict mortality and morbidity after surgery for colorectal cancer (**Schwegler***et al.,* **2010**).The present study aimed to discuss the socio-demographic and dietary habits that might be induced colorectal carcinoma in Egyptian's patients.

Patients and Methods

CRC patients: the subjects were selected from patients who treated in Menoufia Clinical Oncology department, Minufiya University in 2009. Patients who meet the following criteria were enrolled in the study.

Inclusion criteria: CRC patients' age was more than 18 years old;gender:male or female and tumor location: CRC patients suffering from proximal and/or distal colon, rectal or colorectal cancer, all of them had approximately the same chemo and radiotherapy after surgery of tumor.

Exclusion criteria:CRC patients who had lymph node metastasis and who had other diseases

Study Parameters:*All patients were subjected to the following parameters*

Socioeconomic datainclude, age, gender, residency, educational level, marital status, occupation and monthly income were collected and used for calculating socioeconomic level of the family according to equation given by **El-Shakhs, (1996)** as follow:

economic level =[2.359 + (X1×1.016) + (X2×0.886) + (x3×0.622)] ×10

Where :

$X1$ = score of monthly per capita

$X2$ = degree of family head job

$X3$ = degree of family head education

The per capita (X1) were calculated by dividing total family income by family size then classified as follow:

Monthly Per Capita (pound)	Equation Score
From 1 to <= 20 pound/month	1
From 20 <= 40 pound/month	2
From 40 <= 60 pound/month	3
From 60 <= 80 pound/month	4
From 80 <= 100 pound/month	5
From 100 <= 120 pound/month	6
More than 120 pound/month	7

Head family job (X2) were classified into nine categories in ascending matter started by low jobs like workers and ended by high jobs.

Head family education (X3) were classified into eight categories in ascending matter as follow:

Education Level	Equation Score
Illiterate	1
Primary certificate	2
Preparatory certificate	3
Secondary certificate	4
High education (2 years after secondary school)	5
University certificate	6
Master degree	7
Doctoral degree	8

The socioeconomic level calculated by the given equation and the yielded degree classified into 7 categories as follow :

Socioeconomic class	Equation score
Very low	From 48 to = < 72 degree
Low	From 73 to = < 96 degree
Sub-moderate	From 97 to = < 120 degree
Moderate	From 121 to = < 144 degree
Up-moderate	From 145 to = < 168 degree
High	From 169 to = < 192 degree
Very high	More than 192 degree

*Adapted from **(EL Shakhs, 1996)**.

We modify the seven level into three levels by combining very low and low levels into Low; sub-moderate, moderate, and up-moderate into Moderate; and high and very high into High.

Socioeconomic Level	Degree Range
Low	Less than 96
Moderate	97 – 168
High	More than 169

Dietary Data (Food habits): data including number of daily meals, omitted meals, fast and canned foods, foods associated and inducing CRC, protective and functional foods, food allergy, method of cooking, supplemented nutrients and diet system ...etc were collected.

Statistical analysis: the collected data were subjected to statistical analysis to find out frequency distribution of non-parametric variables; using Statistical Package of Social Science program (version 10) **(SPSS, 1998)**.

Results and Discussion

1.Socioeconomic status

The results of table (1) showed the distribution of colorectal cancer patients according to demographic data. As shown most of studied patients were from rural areas (80%). Also, the majority of them were males' represents (52.5%) while females represent (47.5%). In parallel, recent studies of **Nguyen *et al.,* (2009)** mentioned that men are more likely to develop CRC than women.The lower rates for women are compatible with a degree of hormonal protection based on oral contraceptive and hormone replacement therapy as mentioned by **Gao*et al.,* (2008)**.As for patients' education, the majority of patients had university certificate (30%), while most patients were illiterate or had preparatory(descent 22.5% for one of them). Owing to the results of **Almurshed (2009)**, who showed that low education level had significant risk factor for colorectal carcinoma, while higher educational attainment was associated with greater delay for patients with colorectal cancer. Regarding the patient's job, the majority patient's job were employee by 47.5%. These findings supported by that obtained by**Lo *et al.,* (2010)** who showed that agricultural and industrial exposures were associated with increased risk of colorectal carcinoma.As for marital status, the most percent of patients were married by 80%.Marital status or living with a partner was found to be unrelated to upper gastrointestinal diseases **(Macdonald *et al.,* 2006)**.

Regarding socioeconomic level, the majority of patients were classified as moderate class, represents 70%. In accordance with our results, lower socio-economic status (SES) was associated with increased delay by patients presenting with symptoms of gastrointestinal

cancers **(Macdonald *et al.,* 2006)**. Moreover, **Le***et al.,* **(2008)** mentioned that poor survival among colorectal cancer cases has been associated with SES.

Table (1): Distribution of colorectal cancer patients according to socio-demographic Characteristic

	Total	
	Freq.	*%*
Residency		
Rural	32	80.0
Urban	08	20.0
Total	40	100.0
Gender		
Male	21	52.5
Female	19	47.5
Total	40	100.0
Educational level		
Illiterate	09	22.5
Primary	10	25.0
Preparatory	09	22.5
University	12	30.0
Total	40	100.0
Patients Job		
Farmer/ Sentinel/ Handyman	09	22.5
Employee	19	47.5
Academic Lecturer	1	2.5
Housewife	11	27.5
Total	40	100.0
Marital status		
Married	32	80.0
Widowed	04	10.0
Divorced	04	10.0
Total	40	100.0
Socioeconomic class*		
Low	02	05.00
Moderate	28	70.00
High	10	25.00
Total	40	100.0

*Calculatedaccording to **El Shakhs, (1996)**.

2.Food habits

Diet plays an important role in the pathogenesis of colorectal cancer. In consequence of our results in table (2) showed the distribution of CRC patients according to food habits. As for meals number, most of

patients (47.50%) were eating three meals daily, while more half of patients skipped breakfast resulting from loss of appetite and/or sickness by percent 27.50% and 17.50%, respectively.Regarding foods promoted colorectal cancer, high percentage (75%) of CRC patients habituated to eat fast foods. Also, 47.50% of studied patients habituated to eat canned foods like meats (25%), juices (17.50%) and sauce (5%). By fortunately, recent studies reported a weak association between colorectal adenomas and high consumption of sweetened baked goods **(McKelvey*et al.,* 2000).**The consumption from smoked and/or salted meats was the highest (52.50%) among studied groups. Our results were confirmed by**Vano*et al.,* (2009)** who suggested that a diet high in red meat and fat may increase a person's risk of getting colorectal cancer. Also, **Stewart andKleihues, (2003)** confirmed that animal protein (red meat) appears to have a strong consistent independent association with colon cancers. Unfortunately, considerable percentage by 70% of patients were

eating pickles regularly. Drinking tea and coffee were seen among 87% of patients that was heavy or moderate concentrate by 37.50% and 60% respectively. While, 12.50% consumed chocolate and 77.50% habituated to drink fresh juices. In the same trend, **Thomson and Martínez**, **(2010)** were confirmed the associations between coffee and tea beverage intake and colorectal neoplasia risk. However, a modest positive association with higher tea consumption is possible.

Otherwise, more than half of patients did not drink water regularly, while 37.50% of patients drank water for thirst. For establishing the mechanism of action **Tang *et al.,* (1999)** suggested that increased water intake may have an important role in reducing colon cancer risk by decreasing bowel transit time, reducing the mucosal contact with carcinogens, and decreasing the concentration of carcinogens.

As regard benefit and protective foods, most of colorectal cancer patients used to eat liver or other organs by 25%, and 70% of patients cooked organs while 25% ate raw organs. In contrast, 67.50% of patients did not eat honey or nuts, and 57.50% used to eat cheese daily. **Jenab*et al.,* (2004)** suggested that higher intake of nuts and seeds may be associated with a reduced incidence of colon cancer in women with no observed effects on rectal cancer for either gender.

Also 80% of patients consumed eggs continuously and this results agreed with both of **Aune***et al.,* **(2009)** who suggested that,the presence of a variety of bioactive compounds, including cholesterol, lends biological plausibility to a role of egg consumption in the aetiology of colorectal cancer. In dissent theory, **Ishikawa** *et al.,* **(2009)** indicated that dietary egg yolk proteins have a preventive effect on large bowel carcinogenesis; it exerts this effect by altering cell proliferation through short-chain fatty acids (SCFAs) production.

On the other hand, high percentage of CRC patients did not eat yogurt, represents 52.50% of studied patients. It agreed with results of **Geier***et al.,***(2006)** who demonstrated that yoghurt may exert antitumour activity by a decrease in the inflammatory immune response mediated by IgA increase (an immune barrier in colonic neoplasia).With regard to eating fresh fruits and vegetables or salad, 27.50% only of patients used to eat fresh salad daily, while 7.50% did not eat it absolutely. Moreover, 47.50% of patients did not eat fresh onions and/or garlic. Consumption of fruit and vegetables could confer protection through anticarcinogenic components, such as antioxidants (in particular, carotenoids and vitamin C), folic acid, flavonoids, organosulfides, isothiocyanates, and protease inhibitors that might influence DNA damage and thus reduce mutations **(Frei, 1994)**. Regarding the fiber food content, only 12.50% of patients used to eat whole grains daily, while 60% did not eat it absolutely. Furthermore, fiber has been proposed to dilute or adsorb fecal carcinogens, modulate colonic transit time, alter bile acid metabolism, reduce colonic pH, or increase the production of short-chain fatty acids**(ACS and AICR, 2010)**.

With respect to adipose tissue and fat food content, the highest percent (55%) of patients did not remove poultry skin or adipose fat from meats. Furthermore, most of them drank whole milk and cream where it was 82.50% of patients. Nevertheless, it agreed with**Parodi, (2007)** who mentioned that the predominant protein in milk, casein, its peptides, but not liberated amino acids, have antimutagenic properties. Both calcium administration and dairy food administration are associated with lowering aqueous fecal concentrations of bile acids and fatty acids accompanied by a highly significant lowering of cytotoxicity.

As for preferred method of food cooking, the same table showed that the majority of patients (57.50%) preferred the stew method. While

20% and 22.50% of patients preferred the boiled and grilled or fried methods respectively. These results are consistent with the hypothesis that carcinogenic compounds formed by high-temperature cooking techniques, such as heterocyclic amines and polycyclic aromatic hydrocarbons, may contribute to the risk of developing colorectal tumors as mentioned by**Ngoan*et al.,* (2009).**

On the other hand, most of colorectal cancer patients (85%) did not eat any herbals or treated plants, except 15% were used to consume green tea as anti-carcinogenic agent as mentioned by **Shankar *et al.,* (2007)** whoelucidated that Epigallocatechin-3-gallate (EGCG), a major polyphenol found in green tea, is a widely studied chemopreventive agent with potential anticancer activity. Finally, the majority of patients (87.50%) did not follow diet system, while 12.50% followed it irregularity.

Table (2): Distribution of colorectal cancer patients according to food habits

	Total	
	Freq.	*%*
Meals number		
Two meals	19	47.5
Three meals	19	47.5
Four meals	02	05.0
Total	40	100.0
Skipped meals		
None	21	52.50
Breakfast	16	40.0
Lunch	0	0.0
Dinner	3	7.50
Total	40	100.0
Skipped from		
No	21	52.50
Loss of appetite	11	27.50
Sickness	8	20
Total	40	100.0
Eat breakfast regularly		
No	11	27.50
Sometimes	22	55.0
Yes	7	17.50
Total	40	100.0
Habituated to eat fast foods		
No	10	25.0
Sometimes	15	37.5

	Total	
	Freq.	*%*
Yes	15	37.5
Total	40	100.0

Habituated to eat canned food

No	21	52.50
Sometimes	13	32.50
Yes	6	15.0
Total	40	100.0

Kind of canned foods

No	21	52.50
Meats	10	25.00
Sauce	2	05.00
Juices	7	17.50
Total	40	100.0

Habituated to drink beverages

No	27	67.50
Sometimes	7	17.50
Yes	6	15.00
Total	40	100.0

Habituated to eat colored sweet foods

No	6	15.00
Some times	9	22.50
Yes	25	62.50
Total	40	100.0

Habituated to eat smoked and/or salted meats

No	1	02.50
Some times	18	45.00
Yes	21	52.50
Total	40	100.0

Habituated to eat pickles

Freq.	1	02.50
Some times	11	27.50
Yes	28	70.00
Total	40	100.0

Habituated to eat salted cheese

No	0	0.0
Some times	18	45.00
Yes	22	55.00
Total	40	100.0

Favorite food tasted

High salted	19	47.50
Moderate	20	50.00
Low salted	1	2.50

	Total	
	Freq.	*%*
Total	40	100.0
Drink tea or coffee		
No	5	12.50
Some times	16	40.00
Yes	19	47.50
Total	40	100.0
Tea concentrate		
Heavy	15	37.50
Moderate	24	60.00
Light	1	2.50
Total	40	100.0
Eat chocolate		
No	35	87.50
Some times	5	12.50
Yes	0	0.0
Total	40	100.0
Drink fresh juices		
No	9	22.50
Some times	26	65.00
Yes	5	12.50
Total	40	100.0
Drink water regularly		
No	22	55.00
Some times	15	37.50
Yes	3	7.50
Total	40	100.0
Eat liver or other organs		
No	8	20.00
Some times	22	55.00
Yes	10	25.00
Total	40	100.0
Eat cooked or raw organs?		
No	2	05.00
Raw	10	25.00
Cooked	28	70.00
Total	40	100.0
Eat honey or nuts		
No	27	67.50
Some times	12	30.00
Yes	1	2.50
Total	40	100.0
Eat cheese daily		
No	1	2.50

	Total	
	Freq.	*%*
Some times	16	40.00
Yes	23	57.50
Total	40	100.0
Eat eggs		
No	8	20.00
Some times	19	47.50
Yes	13	32.50
Total	40	100.0
Eat yogurt daily		
No	21	52.50
Some times	14	35.00
Yes	5	12.50
Total	40	100.0
Eat fresh fruits and vegetables or salad daily		
No	3	7.50
Some times	26	65.00
Yes	11	27.50
Total	40	100.0
Eat fresh onions and/or garlic		
No	19	47.50
Some times	16	40.00
Yes	5	12.50
Total	40	100.0
Kind of eating bread		
Whole bread	23	57.50
Light bread	12	30.00
Other kinds	5	12.50
Total	40	100.0
Eat whole grains daily		
No	24	60.00
Some times	11	27.50
Yes	5	12.50
Total	40	100.0
Remove poultry skin or adipose fat from meats		
No	22	55.00
Some times	16	40.00
Yes	2	5.00
Total	40	100.0
Drink whole milk and cream		
No	7	17.50
Some times	15	37.50
Yes	18	45.00
Total	40	100.0

	Total	
	Freq.	*%*
Kind of cooked fat		
Dehydrated fat	14	35.00
Butter	1	2.50
Ordinal fat	6	15.00
Oil	19	47.50
Total	40	100.0
Preferred method of food cooking		
Boiled	8	20.00
Grilled & fried	9	22.50
Stew	23	57.50
Total	40	100.0
Have food allergy		
No	33	82.50
Some times	2	5.00
Yes	5	12.50
Total	40	100.0
If yes, which food		
None	33	82.50
Eggs	3	7.50
Mango	1	2.50
Legumes	1	2.50
Fish & marine foods	2	5.00
Total	40	100.0
Any supplemented nutrients		
No	34	85.00
Some times	5	12.50
Yes	1	2.50
Total	40	100.0
Administrated herbals or treated plants		
No	34	85.00
Some times	6	15.00
Yes	0	0.0
Total	40	100.0
Diet system followed		
No	35	87.50
Some times	5	12.50
Yes	0	0.0
Total	40	100.0

Conclusion: a diet rich in vegetables, fruits, whole grain products, and legumes added by low-fat dairy products, fish, and poultry, in side increased water intake can be recommended. In contrast the

consumption of sweets, refined white flour products and meat products should be reduced.

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العادات الغذائية والديموجرافية الرئيسية المسببة لسرطان القولون والمستقيم لدى بعض المرضى المصريين

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الملخص العربي:

يعتبر سرطان القولون والمستقيم ثالث أكثر أمراض السرطان شيوعا في العالم. و تضم تلك الحالات في مصر حوالي ٤.٤٪ من جميع الأورام الخبيثة. و يعتبر سرطان القولون والمستقيم هو أكثر انتشارا في البلدان التي لديها النظام الغذائي المنشط لذلك (الغني باللحوم والدهون الحيوانية، والكربوهيدرات البسيطة والفقيرة في الألياف). و تعاني عدة مناطق جغرافية من الارتفاع المتزايد في معدل الإصابة الذي يبدوأن له علاقة أكبر بالرخاء و مستوى المعيشة المرتفع و يصاحب ذلك أيضا نظامهم الغذائي. لذا تهدف هذه الدراسة إلى مناقشة العادات الغذائيةالرئيسية التي يمكن أن تتسبب سرطان القولون والمستقيم فيمصر. وأشارت النتائج أنغالبية المرضى من الطبقة المتوسطة، وتمثل ٧٠٪. فيما يخص الأطعمة المحفزة لسرطان القولون والمستقيم، نسبة مرتفعة (٧٥٪) من المرضى إعتاد على تناول الأطعمة السريعة.وكانمعدل الاستهلاك من اللحوم المدخنة و/أوالمملحة بنسبة (٥٢.٥٠٪) بين المجموعات المدروسة. علاوة على ذلك، ٥٥٪ من المرضى تعتاد على تناول الجبن المملحيوميا، بينما يستهلك ٤٥٪ اللحوم المملحة أوالجبن بشكل غير منتظم. فيما يتعلق بالأنسجة الدهنية ومحتوى الغذاء من الدهون، فأعلى نسبة (٥٥٪) من المرضى لا تعتاد على إزالة الجلد من الدواجن أوالشحوم المشبعة من اللحوم. بالإضافة لذلك، معظم المرضى يعتاد شربالحليب كامل الدسموالقشدةحيث كان بنسبة ٨٢.٥٠٪ من المرضى. و فيما يتعلق بالأطعمة الجيدة والواقية، ١٢.٥٠٪ فقطمن المرضى تعتاد فطورالحبوب الكاملة يوميا، في حين أن ٦٠٪ لم يتناولها على الإطلاق، ٢٧.٥٠٪ فقط من المرضى تتناول الفواكه والخضروات أوالسلطة الطازجة يوميا. على النقيض، أكثر منتصف المرضى لم يعتادوا شرب الماء بانتظام.