A study of the prevalence of Risk factors of Colo – rectal tumors in Majmmah , Saudi Arabia.

Meshal Almutairi, Dr. Syed Meraj, Abdullah Almutairi
Thamer Sallum, Naif AlMutairi, Madallah Alanazi

Abstract— Most colorectal cancers begin as a growth called a polyp on the inner lining of the colon or rectum. Several lifestyle-related factors have been linked to colorectal cancer. In fact, the links between diet, weight, and exercise and colorectal cancer risk are some of the strongest for any type of cancer. Studies have shown people with certain risk factors are more likely than others to develop colorectal cancer such as age, family history, inflammatory bowel diseases, cigarette smoking, diets high in red meat and fat.Methodology: This is a cross – sectional questionnaire based study onprevalence of the risk factors among the patients with colo – rectal cancer in Majmaah, Saudi Arabia. was analyzed by using the SPSS ver. 21.0 software. Results: The studyshows the association of risk factors with the occurrence of colorectal cancer. Among males there is seen a statistically significant association of sedentary lifestyle with the development of colorectal cancer(%64.4)Females also show a high association(74.5%) but it is not statistically significant. Other risk factors showing positive association were low fiber and high fat diet, smoking and radiation exposure. Conclusion: This study found thatthe majority of the participants were found to be positive for one or more risk factors. This can be a basis to identify high risk people at an early stage to prevent the occurrence of cancer and ensure proper preventive measures.

Index Terms— colorectal cancer, risk factors, Majmaah, Saudi Arabia, elderly

1 Introduction

Colorectal cancer is a cancer that starts in the colon or the rectum. These cancers can also be named colon cancer or rectal cancer, depending on where they start. Most colorectal cancers begin as a growth called a polyp on the inner lining of the colon or rectum. (1) Several lifestyle-related factors have been linked to colorectal cancer. In fact, the links between diet, weight, and exercise and colorectal cancer risk are some of the strongest for any type of cancer. (2) Other researches and studies has shown people with certain risk factors are more likely than others to develop colorectal cancer such as if the age over 50 years colorectal cancer becomes more common as people get older. In fact, more than 90% of people with this disease are diagnosed after age 50. The average age at diagnosis is 72., family history of polyps, family history of colorectal cancer showed that the first degree relatives (parents, brothers, sisters or children) of a person with a history of colorectal cancer are more likely to develop this disease, especially if the relative was diagnosed at a young age. Also the inflammatory bowel diseases such as , ulcerative colitis or crohn's disease these diseases increase the risk due to longstanding inflammation process, cigarette smoking, regarding the diet many studies suggest that diets high in red meat and fat (especially animal fat) and low in calcium, folate and fiber may increase risk of colorectal cancer.(3) In United Kingdome an estimated 5% of colon cancer has been linked to inadequate physical activity, and 13% of bowel cancers has been linked to overweight or obesity each year.(4) people with type 2 diabetes have been found to be in higher risk to develop colorectal cancer.(5)

2 Review of Literature

Inflammatory bowel disease and history of Colo-rectal Cancer (CRC) in first-degree relatives are associated with much higher risk of CRC. Increased BMI, red meat intake, cigarette smoking, low physical activity, low vegetable consumption, and low fruit consumption were associated with moderately increased risk of CRC. (6) Red meat intake is associated with elevated risk of developing colorectal cancer. The frequency of red meat consumption rather than total amount of consumed meat is associated with a higher risk of colorectal carcinogenesis. (7) Studies by Colinda C et al found that regular long-term physical activity and fewer sitting hours may protect against colon cancer, particularly distal colon cancer. (8)Alternatively, Louise Hansen et al in their study discovered that there is a protective role of total and cereal fiber intake, particularly from cereal foods with high fiber content, in the prevention of colon cancer. (9) In Saudi Arabia, TarekTaufik et al found that Saudi patients with CRC present late with distant metastasis, and advanced disease stage. A sizeable proportion of patients developed the lesions at relatively young age. (10) Abdulrehman in his study on the prevalence of colo-rectal cancer in Saudi Arabia recommended the need for a mass screening program to be implemented for this common and preventable cancer in Saudi Arabia (11). Recent study In Riyadh , Saudi Arabia discovered that physical activity, Family history , and the use of Non steroidal anti-inflammatory drugs was independently associated with the risk of colorectal cancer. It was also observed that CRC Cases had higher daily intake of consumed total calories.(12) Hsing AW in a study among U.S. white men discovered that risk of colon cancer was elevated among heavy cigarette smokers.(13) another study in United States discover that age and family history of colorectal cancer increases the risk of developing colorectal cancer, heredity conditions such as polyposis and hereditary

nonpolyposis history of inflammatory bowel disease and polyps found to increase th risk of developing colorectal cancer . (14) Slattery ML in his study found that A family history of colorectal cancer in any first-degree relatives slightly increased risk of rectal cancer. Family history of colorectal cancer was associated with the greatest risk among those diagnosed at age 50 or younger.(15)David Limsui found that Every-smokers were at moderately increased risk for incident colorectal cancer compared with never-smokers.(16)

3 General objective

- To study the risk factors associated with colo-rectal cancer among patients aged more than 55 years attending surgery clinic in the hospital in the Sudair region of Saudi Arabia
- Specific objectives:
- To assess the risk factors associated with the development of colo-rectal cancer among the study participants.
- To study the socio – demographic characteristics of participants at risk of colorectal cancer.
- To give recommendations to reduce the risks of developing colo-rectal cancer among the aged population in the given region.

4 Methodology

This is a cross – sectional study to find out the risk factors associated with colo-rectal cancer, in Majmaah city, KSA. The study participants will consist of saudi patients aged more than 55 years of age attending the hospital and primary health care clinics in Majmaah city, KSA.A cross sectional study in randomly selected people who attending the hospital and primary health centers clinics. in Majmaah, KSA.
Data will be collected by using a checklist which contain personal data and risk factors of colorectal cancer.
The data collection will take around 6 months to be completed as planned.
A pretested, preformed interviewee based and close ended questionnaire will be used to collect data from the study partici
All the data will be entered in the SPSS software and statistical analysis will be done. Statistical tests like Pearson's Chi square tests and analysis of variance will be used to find out the significance of the prevalence of the risk factors of colo-rectal cancer in Majmaah, KSA.
. A 95% degree of freedom with p-value of <0.05 would be considered as statistically significant.

5 Ethical Considerations

All the data will be kept confidential and relevant information will be used only for the research purpose. The ethical approval will be obtained from the ethical committee of the Basic Health Research Centre of Majmaah University.

6 Results

Table – 1: Distribution of the study population by age and gender

Age category	Gender		Total (%)
	Male (%)	Female (%)	
55 – 60 years	37 (35.2)	22 (39.3)	59 (36.6)
61 – 65 years	21 (20.0)	14 (25.0)	35 (21.7)
66 – 70 years	18 (17.1)	9 (16.1)	27 (16.8)
> 70 years	29 (27.6)	11 (19.6)	40 (24.8)
Total	105 (100)	56 (100)	161 (100)

A total of 161 participants took part in the study as seen in table – 1. Most of the participants were within the 55 – 60 age group (36.6%) while the next major group were those more than 70 years of age (24.8%). If looked according to gender, then females also made up the major part of the participants in the 55 – 60 year age group (39.3%). But the next big group among females were in the 61 – 65 years of age category (25.0%). This showed that females tend to get the colorectal cancer earlier than males.

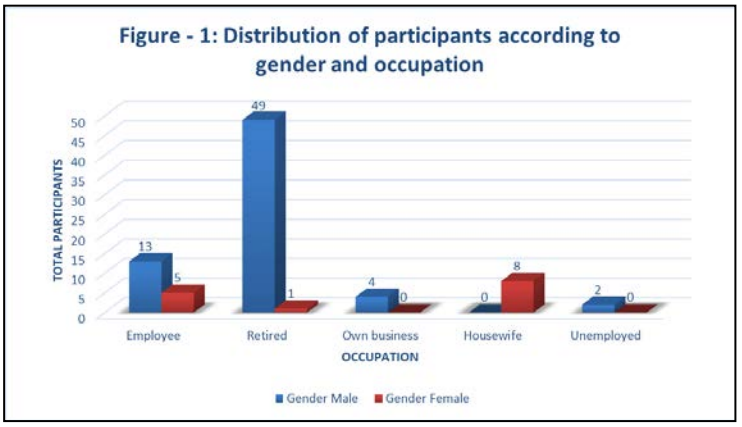

Figure – 1 shows the distribution of occupation with gender and we see that most of the males are retired people. Among females they are mostly housewife while some of them are still employees.

Table – 2: Age and gender distribution of past history of illnesses associated with the development of colorectal cancer

Variables	Gender		Age category (years)				Total	p value
			55 – 60	61 – 65	66 – 70	> 70		
History of Crohn's disease	Male	Present	0 (0.0)	0 (0.0)	0 (0.0)	1 (3.4)	1 (1.0)	0.45
		Absent	37 (100)	21(100)	18(100)	28(96.6)	104 (99.0)	
	Female	Present	0 (0.0)	1 (7.1)	0 (0.0)	0 (0.0)	1 (1.8)	0.394
		Absent	22(100)	13 (92.9)	8(100)	11(100)	54 (98.2)	
History of Ulcerative colitis	Male	Present	1 (2.7)	1 (4.8)	0 (0.0)	1 (3.6)	3 (2.9)	0.837
		Absent	36 (97.3)	20 (95.2)	18 (100)	27 (96.4)	101 (97.1)	
	Female	Present	0 (0.0)	0 (0.0)	2 (22.2)	1 (9.1)	3 (5.4)	0.06
		Absent	22 (100)	14 (100)	7 (77.8)	10 (90.9)	53 (94.4)	
Family history of colorectal cancer	Male	Present	5 (13.5)	2 (10.0)	4 (22.2)	9 (31.0)	20 (19.2)	0.205
		Absent	32 (86.5)	18 (90.0)	14 (77.8)	20 (69.0)	84 (80.8)	
	Female	Present	3 (13.6)	3 (21.4)	1 (11.1)	0 (0.0)	7 (12.5)	0.452
		Absent	19 (86.5)	11 (78.6)	8 (88.9)	11 (100.0)	49 (87.5)	
History of genetic syndromes	Male	Present	1 (3.0)	0 (0.0)	0 (0.0)	1 (3.6)	2 (2.0)	0.739
		Absent	32 (97.0)	20 (100.0)	17 (100.0)	27 (96.4)	96 (98.0)	
	Female	Present	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	-
		Absent	21 (100.0)	13 (100.0)	9 (100.0)	11 (100.0)	54 (100.0)	

($p<0.05$ is significant)

This study tried to explore the association between any past history of illnesses that can be a pre – cursor to colorectal cancer and so can be deemed to be a risk factor. It is seen that there is a significant association between history of ulcerative colitis and colorectal cancer among females ($p<0.05$). Though there is a positive history of associated gastro – intestinal disorders among both males and females but it is not statistically significant as seen in table – 2 above.

Table – 3: Age and gender distribution of risk factors associated with the development of colorectal cancers.

Risk factors	Gender		Age category (years)				Total	p value
			55 – 60	61 – 65	66 – 70	> 70		
Low fibre and high fat diet	Male	Present	19(52.8)	13(61.9)	13(76.5)	16(55.2)	61(59.2)	0.396
		Absent	17(47.2)	8(38.1)	4(23.5)	13(44.8)	42(40.8)	
	Female	Present	8(36.4)	10(71.4)	4(44.4)	5(45.5)	27(48.2)	0.227
		Absent	14(63.6)	4(28.6)	5(55.6)	6(54.5)	29(51.8)	
Sedentary lifestyle	Male	Present	21(56.8)	9(45.0)	13(72.2)	24(82.8)	67(64.4)	**0.03**
		Absent	16(43.2)	11(55.0)	5(27.8)	5(17.2)	37(35.6)	

Sedentary lifestyle	Male	Present	21(56.8)	9(45.0)	13(72.2)	24(82.8)	67(64.4)	**0.03**
		Absent	16(43.2)	11(55.0)	5(27.8)	5(17.2)	37(35.6)	
	Female	Present	13(59.1)	10(76.9)	9(100.0)	9(81.8)	41(74.5)	0.103
		Absent	9(40.9)	3(23.1)	0(0.0)	2(18.2)	14(25.5)	
Diabetes Mellitus	Male	Present	19(51.4)	11(52.4)	11(61.1)	22(75.9)	63(60.0)	0.194
		Absent	18(48.6)	10(47.6)	7(38.9)	7(24.1)	42(40.0)	
	Female	Present	14(63.6)	11(78.6)	6(66.7)	6(54.5)	37(66.1)	0.640
		Absent	8(36.4)	3(21.4)	3(33.3)	5(45.5)	19(33.9)	
Obesity	Male	Present	14(37.8)	10(47.6)	10(55.6)	10(35.7)	44(42.3)	0.510
		Absent	23(62.2)	11(52.4)	8(44.4)	18(64.3)	60(57.7)	
	Female	Present	13(59.1)	3(21.4)	3(33.3)	3(27.3)	22(39.3)	0.100
		Absent	9(40.9)	11(78.6)	6(66.7)	8(72.7)	34(60.7)	
History of smoking	Male	Present	17(47.2)	6(28.6)	8(47.1)	10(35.7)	41(40.2)	0.478
		Absent	19(52.8)	15(71.4)	9(52.9)	18(64.3)	61(59.8)	
	Female	Present	0(0.0)	1(7.1)	1(11.1)	2(18.2)	4(7.4)	0.303
		Absent	20(100.0)	13(92.9)	8(88.9)	9(81.8)	50(92.6)	
Exposure to radiation	Male	Present	10(27.0)	6(30.0)	7(38.9)	9(31.0)	32(30.8)	0.848
		Absent	27(73.0)	14(70.0)	11(61.1)	20(69.0)	72(69.2)	
	Female	Present	5(23.8)	5(35.7)	5(55.6)	7(63.6)	22(40.0)	0.118
		Absent	16(76.2)	9(64.3)	4(44.4)	4(36.4)	33(60.0)	

pants took

P < 0.05 is significant

Table – 3 shows the association of risk factors with the occurrence of colorectal cancer. Among males there is seen a statistically significant association of sedentary lifestyle with the development of colorectal cancer. Females also show a high association, but it is not statistically significant. Low fiber and high fat diet is also considered a precursor to the development of colorectal cancer and there is a higher percentage of both the gender agreeing to the kind of dietary preferences, but it is not statistically significant in this study. Most of the participants both male and female are having diabetes which is regarded as a risk factor but again in this study the findings are not statistically significant. Smoking and exposure to radiation shows a lesser percentage of positivity among the participants but are regarded as important determinants for the development of colorectal cancer.

7 Discussion

Most of the researchers in their study design do not consider sex specificity for study, However, females over 65 years old show higher colorectal cancer compared to their age-matched male , In the same study , diet has been linked to the develpment of colorectal cancer. (17) A total of 161 participant in the study females made up the major part of the participants in the 55 – 60 year age group (39.3%). This showed that females tend to get the colorectal cancer earlier than males. Low fiber and high fat diet is also considered a precursor to the development of colorectal cancer and there is a higher percentage of both the gender agreeing to the kind of dietary preferences, but it is not statistically significant in this study , males (59.2%) and females (48.2%) .Multiple studies worldwide have shows that colorectal cancer one of the most preventable cancer in both females and males,colorectal cancer canada showed that several studies find that patient with family history of colorectal cancer,personal history and inflammatory bowel disease, have a higher risk to develop coloerectal cancer[18,19] Our study has tried to analyze the prevalence of the risk factors of colo-rectal cancer in Majmmah of Saudi Arabia. It is seen that there is a significant association between history of ulcerative colitis and colorectal cancer among females(5.4%)the study shows there is a positive history of associated gastrointestinal disorders among both males and females but it is not statistically significant . (2.9%) of ulcerative colitis in males ,Crohn's disease males (1%) and female (1.8%) .Similarly other studies showed a positive coloration between smoking, sedentary life style and obesityto the devolpment ofcolocertal cancer [20]in our study Among both males and females there is association of sedentary lifestyle with the

development of colorectal cancer butfemales association is not statistically significant , lesser percentage found in smoking and exposure to radiation, but both risk factors shows a relation in the devolpment of colorectal cancer.

8 Conclusion

This study is attempts to prove that based on local and international studies there is hight association between risk factors of colorectal cancer and the develpment of such cancer , patient who found to have either single or multiple risk factor tend to be in more risk than people who don't have any . Result of the study indicate advanced age put the people in high risk ,but does not indicate significant difference between colorectal cancer development in both gender .

9 Recommendation

A pilot attempt of our paper to establish a baseline study to assess thethe prevalence of the risk factors of colo-rectal cancer in Majmmah of Saudi Arabia.

Multiple risk factors shown to be positive which can be prevented by different intervention methods ,patient with both genetic and environmental risk factors need close follow up and close assessment , earlier endoscopic intervention should be considered in a high risk patient , other intervention should inclue people awareness of the cancer and relation to risk factors , for example smoking , diet , low physical activity can be decreased by people awareness.

10 References

[1] https://www.cancer.org/cancer/colon-rectal-cancer/about.html
[2] https://www.cancer.org/cancer/colon-rectal-cancer/causes-risks-prevention/risk-factors.html
[3] https://www.ccalliance.org/get-information/what-is-colon-cancer/risk-factors/
[4] http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics- by-cancer-type/bowel-cancer/risk-factors#heading-Nine
[5] http://www.diabetes.co.uk/diabetes-complications/colon-cancer.html
[6] Johnson CM, Wei C, Ensor JE, Smolenski DJ, Amos CI, Levin B, Berry DA. Meta-analyses of colorectal cancer risk factors. Cancer causes & control. 2013 Jun 1;24(6):1207-22D.S. Coming and O.G. Staadt, "Velocity-Aligned Discrete Oriented Polytopes for Dynamic Collision Detection," IEEE Trans. Visualization and Computer Graphics, vol. 14, no. 1, pp. 1-12, Jan/Feb 2008, doi:10.1109/TVCG.2007.70405. (IEEE Transactions)
[7] Smolinska K, Paluszkiewicz P. Risk of colorectal cancer in relation to frequency and total amount of red meat consumption. Systematic review and meta-analysis. Arch Med Sci. 2010 Aug 30;6(4):605-10H. Goto, Y. Hasegawa, and M. Tanaka, "Efficient Scheduling Focusing on the Duality of MPL Representation," Proc. IEEE Symp. Computational Intelligence in Scheduling (SCIS '07), pp. 57-64, Apr. 2007, doi:10.1109/SCIS.2007.367670. (Conference proceedings)
[8] Simons CC, Hughes LA, Van Engeland M, Goldbohm RA, Van Den Brandt PA, Weijenberg MP. Physical activity, occupational sitting time, and colorectal cancer risk in the Netherlands cohort study Am J Epidemiol. 2013 Mar 15;177(6):514-30..
[9] Hansen L, Skeie G, Landberg R, et al. Intake of dietary fiber, especially from cereal foods, is associated with lower incidence of colon cancer in the HELGA cohort. International journal of cancer. 2012 Jul 15;131(2):469-78.
[10] Amin, TarekTawfik. Patients' profile, clinical presentations and histopathological features of colo-rectal cancer in Al Hassa region, Saudi Arabia. Asian Pac J Cancer Prev. 2012;13(1):211-6.
[11] Aljebreen AM. Clinico-pathological patterns of colorectal cancer in Saudi Arabia: younger with an advanced stage presentation. Saudi Journal of Gastroenterology. 2007 Apr 1;13(2):84
[12] Fahad A, Alamri, Mohammed Y,Saeedi, Kassim A,Kassim. Dietary and other risk factors for Colo-Rectal cancer in Saudi Arabia. Journal of Medicine and Medical Sciences. 2014 November;5(10):222-229,
[13] Hsing AW, McLaughlin JK, Chow WH, et al. Risk factors for colorectal cancer in a prospective study among U.S. white men. Int J Cancer. 1998 Aug 12;77(4):549-53
[14] FarinAmersi M.D., Michelle Agustin M.P.H and Clifford Y. Ko M.D. "Colorectal Cancer: Epidemiology, Risk Factors, and Health Services" Clin Colon Rectal Surg. 2005 Aug; 18(3): 133–140
[15] Slattery ML1, Levin TR, Ma K, Goldgar D, Holubkov R, Edwards S. Family history and colorectal cancer: predictors of risk. Cancer Causes Control. 2003 Nov;14(9):879-87
[16] David Limsui, Robert A.Vierkant, et al. Cigarette Smoking and Colorectal Cancer Risk by Molecularly Defined Subtypes. J Natl Cancer Inst. 2010 Jul 21; 102(14): 1012–1022.
[17] Sung-Eun Kim, Hee Young Paik, Hyuk Yoon, Jung Eun Lee, Nayoung Kim, and Mi-Kyung Sung . Sex and gender-specific disparities in colorectal cancer risk, World J Gastroenterol. 2015 May 7; 21(17): 5167–5175
[18] 18 https://www.cancer.org/cancer/cancer-basics/cancer-prevalence.html
[19] http://www.colorectal-cancer.ca/en/just-the-facts/risk-factors/
[20] http://www.who.int/cancer/country-profiles/sau_en.pdf?ua=1