

Alcohol Consumption and the Risk of Developing Colorectal Cancer and Colorectal Polyps

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Purpose: Among other risk factors in the developing of colorectal polyps and colorectal cancer, alcohol consumption represents a real risk factor. We have studied the association between alcohol consumption and the risk of developing colorectal cancer and colorectal polyps.

Materials and methods: We conducted a retrospective study reviewing the medical records of all consecutive patients hospitalized with mucosal modifications at the colon level, investigated by colonoscopy in the 1st Clinic of Gastroenterology of Tîrgu Mureş between 2008 and 2011.

Results: We analyzed 324 patients with colorectal cancer and colorectal polyps, compared with 352 control patients investigated in our medical institution. We had 87 patients with colorectal cancer, out of which 1 patient was an ex-drinker, 31 were occasional drinkers and 17 regular drinkers. We found a strong positive association between alcohol consumption and the risk of colorectal cancer: ex drinkers – statistically insignificant; occasional drinkers – OR = 4.04, CI: 2.31–7.06; regular drinkers – OR = 5.45, CI: 2.65–11.18. Concerning the 237 patients with colorectal polyps we obtained similar results: 5 ex-drinkers – statistically insignificant; 76 occasional drinkers – OR = 3.46, CI: 2.28–5.23; 47 regular drinkers – OR = 5.25, CI: 3.05–9.13.

Conclusions: Our results suggest that alcohol consumption elevates the risk of colorectal polyps and colorectal cancer.

Keywords: alcohol, colorectal cancer, colorectal polyps, smoking, colonoscopy

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Introduction

Alcohol consumption is one of the most important known risk factors for human cancers, and potentially, one of the largest avoidable factors. Intake of alcohol is causally related to cancers of the oral cavity, pharynx, larynx, esophagus, liver, female breast, colon and rectum [1].

Colorectal cancer is the second leading cause of cancer-related deaths among both men and women in the United States. The usual pathogenesis of colorectal cancer is an adenomatous polyp that slowly increases in size, followed by dysplasia and finally cancer [2].

Alcohol consumption is a risk factor of colorectal adenomas and colorectal cancer, this increased risk might be caused by ethanol via carcinogenesis, induction of DNA hypomethylation or tumor promotion, but it might also result from its metabolite acetaldehyde, which was qualified as a probable carcinogen in humans. Ethanol metabolism predominates in the liver, but alcohol dehydrogenase is also expressed in other tissues, including the colon [3]. Fast metabolizers of ethanol would have higher levels of acetaldehyde per gram of tissue in the colonic mucosa compared with all other tissues and would therefore be at greater risk for colorectal cancer [4].

We studied the association between alcohol consumption and the risk to develop colorectal cancer and colorectal polyps.

Materials and methods

We have performed a retrospective study reviewing the

medical records of all consecutive patients hospitalized with mucosal modifications at the colon level, investigated by colonoscopy in the 1st Clinic of Gastroenterology of Tîrgu Mureş between 2008 and 2011. We have included patients between the age of 18 and 90 years with newly diagnosed colorectal cancer and colon polyps, having a confirmed pathological diagnosis. Patients with previous colon cancer surgery or an uncertain pathological diagnosis were excluded.

We have recorded demographic data, clinical aspects, colonoscopy findings, and alcohol drinking habits. The study group was divided in 4 sub-groups: 'never drinkers', 'ex-drinkers', 'occasional drinkers' and 'regular drinkers'. The 'regular drinkers' group was divided according to the alcohol quantity consumed in grams/week (1–99 g/week; 100–200 g/week; >200 g/week). The clinical results of the study group were compared with a control group, which contained patients randomly selected from the study area, respecting the same criteria as the study group, except that they had not been diagnosed with colorectal cancer or colon polyps by colonoscopy examination.

The data were collected with Microsoft Excel and analyzed with Graph Pad Instant. We analyzed the association between alcohol drinking and colorectal cancer and colon polyps risk, calculating the odds ratio (OR) and 95% confidence interval with Chi square test, Fisher's exact test and using Yate's continuity correction for categorical variables. Statistical significance was defined as $p < 0.05$.

Results

We included 324 patients in the study, out of which 87 (26.85%) were diagnosed with colorectal cancer and 237

Table I. Alcohol consumption as a risk of colorectal polyps

Alcohol drinkers	Cases		Controls		OR (95% CI)	p value
	No.	%	No.	%		
Both sexes						
Never drinkers	109	45.99	268	76.13	1.00 (reference)	
Ex-drinkers	5	2.10	8	2.27	–	NS
Occasional drinkers	76	32.06	54	15.34	3.46 (2.28–5.23)	0.0001
Regular drinkers (g/week ethanol)	47	19.83	22	6.25	5.25 (3.02–9.13)	0.0001
1–99 g/week	12	5.06	5	1.42	5.90 (2.03–17.15)	0.0006
100–200 g/week	12	5.06	6	1.70	4.91 (1.80–13.43)	0.0017
>200 g/week	23	9.70	11	3.12	5.14 (2.42–10.91)	0.0001
Men						
Never drinkers	37	28.46	102	60.71	1.00 (reference)	
Ex-drinkers	5	3.84	7	4.16	–	NS
Occasional drinkers	44	33.84	39	23.21	3.11 (1.75–5.51)	0.0001
Regular drinkers (g/week ethanol)						
1–99 g/week	10	7.69	4	2.38	–	NS
100–200 g/week	12	9.23	5	2.97	6.61 (2.18–20.06)	0.0005
>200 g/week	22	16.92	11	6.54	5.51 (2.43–12.46)	0.0001

(73.14%) with colon polyps. The mean age was 64.45 years in the study group and 61.20 years in the control group. Clinical aspects and demographical data are shown in Table I.

Alcohol consumption as a risk of colorectal polyps is shown in Table II. From a total of 237 patients with colorectal polyps, 47 patients (19.83%) were 'regular drinkers', compared to control patients (22 patients, 6.25%). According to the study there was a significant association, with an increased risk for colorectal polyps (OR = 5.25, CI: 3.02–9.13). In the 'regular drinkers' sub-group we did not observe important differences concerning the risk of developing colorectal polyps due to alcohol consumption: 1–99 g/week – OR = 5.90, CI: 2.03–17.15; 100–200 g/week – OR = 4.91, CI: 1.80–13.43; >200 g/week – OR = 5.14, CI: 2.42–10.91.

From the group of patients with colorectal polyps a number of 72 patients (32.06%) were occasional drinkers,

compared to 54 patients (15.34%) from the control group. There was a moderate risk of developing colorectal polyps (OR = 3.46, CI: 2.28–5.23).

Alcohol consumption as a risk of colorectal cancer is shown in Table III. Referring to colorectal cancer patients, alcohol consumption increased the risk of developing the illness. The results were the following: 17 regular drinkers (19.54%) had a high risk to develop colorectal cancer OR = 5.45, CI: 2.65–11.18 (1–99 g/week – OR = 5.64, CI: 1.45–21.94; 100–200g/week – OR = 5.87, CI: 1.71–20.20; >200 g/week – OR = 5.12, CI: 1.94–13.54); 31 occasional drinkers presented also a high risk of developing colorectal cancer – OR= 4.04, CI: 2.31–7.06, but lower than regular drinkers.

In our study there were only 5 ex-drinkers without being statistically significant. Due to the reduced number of women drinkers, we could not establish the risk of developing the colorectal cancer and colorectal polyps in women.

Table II. Alcohol consumption as a risk of colorectal cancer

Alcohol drinkers	Cases		Controls		OR (95% CI)	p value
	No.	%	No.	%		
Both sexes						
Never drinkers	38	43.67	268	76.13	1.00 (reference)	
Ex-drinkers	1	1.14	8	2.27	–	NS
Occasional drinkers	31	35.63	54	15.34	4.04 (2.31–7.06)	0.0001
Regular drinkers (g/week ethanol)	17	19.54	22	6.25	5.45 (2.65–11.18)	0.0001
1–99 g/week	4	4.59	5	1.42	5.64 (1.45–21.94)	0.0210
100–200 g/week	5	5.74	6	1.70	5.87 (1.71–20.20)	0.0091
>200 g/week	8	9.19	11	3.12	5.12 (1.94–13.56)	0.0011
Men						
Never drinkers	23	35.93	102	60.71	1.00 (reference)	
Ex-drinkers	1	1.56	7	4.16	–	NS
Occasional drinkers	23	35.93	39	23.21	2.61 (1.31–5.19)	0.0052
Regular drinkers (g/week ethanol)						
1–99 g/week	4	6.25	4	2.38	–	
100–200 g/week	5	7.81	5	2.97	4.43 (1.18–16.60)	0.0321
>200 g/week	8	12.50	11	6.54	3.22 (1.16–8.91)	0.0411

Discussions

Our results suggest that alcohol consumption is positively associated with colorectal polyps and colorectal cancer.

In our study in the group of regular drinkers we could observe a strong association between alcohol consumption and the risk of developing the colorectal polyps (OR = 5.25; CI: 3.02–9.13) and colorectal cancer (OR = 5.45; CI: 2.65–11.18). We could observe that the risk is higher in our study compared to another study (OR = 1.33; CI: 0.85–2.07) [5]. In our study we did not obtain significant differences concerning the risk to develop colorectal polyps between regular drinkers who consume <200 g/week alcohol (OR = 4.91; CI: 1.80–13.43) and those who consume >200 g/week alcohol (OR = 5.14; CI: 2.42–10.91), compared to another study where the heavy drinkers presented a high risk (OR = 3.08; CI: 1.50–6.32) compared to the moderate drinkers (OR = 1.01; CI: 0.53–1.92) [6].

In our data we could observe that even the occasional drinkers had a risk of developing colorectal polyps (OR = 3.46; CI: 2.28–5.23) and colorectal cancer (OR = 4.04; CI: 2.31–7.06), but the risk is lower than in regular drinkers, compared to another study from Japan where the occasional drinkers did not have any elevated risk of colorectal cancer (RR = 0.8; CI: 0.4–1.4) [7].

The ex-drinkers sub-group was represented by a small number of patients, and we obtained no statistically significant results, just as in another study where this sub-group was also not statistically significant [8]. Nevertheless, in another study from Shanghai ex-drinkers had an increased risk of developing colon cancer (OR = 2.3; CI: 1.4–3.7) [9].

The number of women in our study was low and we could not establish any association between alcohol consumption and the risk to develop this illness, but in another study conducted by Tiemersma *et al.* this association was statistically significant (OR = 2.5; CI: 0.2–10.0) [3].

Conclusions

Our results suggest that alcohol consumption increases the risk of colorectal polyps and colorectal cancer. In our study in the group of regular drinkers we could observe a strong association between alcohol consumption and the risk to develop colon polyps and colon cancer, compared to occasional drinkers who only had a moderate risk.

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