

Study Showing the Beneficial Effect of Metformin on Colorectal Cancer

Mehulkumar K Kanadiya*

School of Public Health Sciences and Professions, Ohio University, USA

***Corresponding Author:** Mehulkumar K Kanadiya, School of Public Health Sciences and Professions, Ohio University, USA.

Received: August 03, 2017; **Published:** August 23, 2017

There are many drugs which we use them for their intended purpose. For these drugs, there are other beneficial effects but not enough studied and researched. I am going to talk about the similar drug which has beneficial effect in lowering colorectal cancer. I am talking about the drug Metformin. Metformin has generated lots of interest among research community in recent times. Metformin is commonly prescribed drug all over the world for the treatment of type 2 diabetes.

Metformin drug is a biguanide derivative. Metformin is most commonly used and recommended for the initial medicine for type-2 diabetes due to its glucose lowering effect. The glucose lowering effect of metformin is understood to be due to the inhibition of hepatic glucose production. Metformin trigger the AMP- activated protein kinase Which has been a main agent in mediating beneficial effects of the drug [1]. However, Metformin has been found to produce positive effect on diminishing the risk of colorectal cancer in people with diabetes [2].

There are many possible ways which explain the positive effects of metformin in the colorectal cancer and adenoma patient. *In vivo*, Metformin has been revealed to calm the effect of high energy diet on MC38 colon cancer cell growth [2]. Metformin has inhibitory effect on growth of colon cancer cell which is achieved by activating AMP kinase [3]. Finally, an *in vitro* study designed to investigate the effect of metformin on tumor growth, using the paired isogenic colon cancer cell lines HCT116 p53(+/-) and HCT116 p53(-/-) has shown that metformin selectively impairs p53-deficient tumor cell growth [4]. All these studies support the positive effect of Metformin in prevention of colorectal cancer. Future studies should evaluate whether metformin use reduces colorectal cancer recurrence or whether it reduces the incidence of colorectal cancer in patients with multiple colorectal adenomas.

We performed a study analyzing 3465 report of colonoscopy. The mean age of the study participants was 60.63 years (SD ± 9.203). We had 1697 male (49%) and 1767 female (51%) in our study. The proven adenoma detection rate (ADR) in the all participants was 24.6 % (30.2% in Male and 19.2% in female). As subject's age rises the chance of adenoma detection also increased significantly ($r = 0.045$, $p = 0.008$). Males have 1.8 times more chances of adenoma detection than females (odds ratio = 1.813, 95% CI, 1.55 - 2.12). A total of 426 participants (12.29%) had diabetes and 405 of these participants (11.7%) had type-2 diabetes. Participants who had type-2 diabetes were more likely to have colorectal adenoma detection during colonoscopy compared to those who didn't had diabetes (Odds' ratio 1.35, 95% confidence interval 1.08 – 1.70, $p = 0.009$). The colorectal polyp detection rate was 37.1 % overall while it was considerably higher in participants with type-2 diabetes 41.5% ($p = 0.02$). In general adenoma detection rate among participants (ADR) was 24.6% and was notably higher in participants with type 2 diabetes 29.3% than non-diabetic subjects 23.9% ($p = 0.009$). In our study, total 148 participants were receiving Metformin drug for their diabetes treatment. Participants who were on metformin drug for their diabetes treatment had a significantly lower risk of colorectal adenoma (Odds ratio 0.55, 95% confidence interval 0.34 - 0.87, $p = 0.011$). Thus our study confirms our earlier assertion that the metformin has beneficiary effect on colorectal adenoma and that way colorectal cancer.

Characteristics	All Subjects (n = 3465)	Non-Diabetic (n = 3039)	Type-2 Diabetic (n = 405)	p
Age	60.63 ± 9.20	60.17 ± 9.11	63.96 ± 9.19	< 0.001 *
Gender (male/female)	1698 (49%) / 1767 (51%)	1486/1552	201 (49.6%) / 204 (50.4%)	0.787

Table 1: General characteristics of study population.

*p value < 0.05 which suggest statistically significant difference. p values corresponds to Independent sample t-tests (Diabetic and nondiabetic subjects)

Factor	All Subjects (n = 3465)	Non-Diabetic (n = 3038)	Type-2 Diabetes (n = 405)	p
PDR	37.1	36.5	42.4	0.020*
ADR	24.6	23.9	29.9	0.009 *
Proximal ADR	15.3	14.64	20.0	0.005 *
Distal ADR	12.8	12.44	15.8	0.057
SSPDR	2.3	2.24	3.21	0.225
Proximal SSPDR	1.2	1.12	1.73	0.288
Distal SSPDR	0.5	0.5	0.6	0.321
No. of Polyps/Patient	0.70	0.67	0.94	< 0.001*
No of Adenoma/Patient	0.38	0.36	0.56	< 0.001 *
Proximal Adenomas	0.22	0.20	0.33	<0.001*
Distal Adenomas	0.17	0.15	0.23	0.008*
No. of SSPs/Patient	0.030	0.029	0.044	0.218
Proximal SSP	0.013	0.012	0.019	0.255
Distal SSP	0.017	0.016	0.024	0.405

Table 2: Detection rate among Type-2 diabetic and non-diabetic subjects.

*p value < 0.05 which suggest statistically significant difference. p values corresponds to Independent sample t-tests (Diabetic and nondiabetic subjects). PDR: Polyps Detection Rate; ADR: Adenoma Detection Rate; SSPDR: Sessile Serrated Polyp’s Detection Rate; SSP: Sessile Serrated Polyp.

Bibliography

1. Viollet B., et al. “Cellular and molecular mechanisms of metformin: An overview”. *Clinical Science* (London, England: 1979), 122.6 (2012): 253-270.
2. Algire C., et al. “Metformin blocks the stimulative effect of a high-energy diet on colon carcinoma growth in vivo and is associated with reduced expression of fatty acid synthase”. *Endocrine-Related Cancer* 17.2 (2010): 351-360.
3. Zakikhani M., et al. “The effects of adiponectin and metformin on prostate and colon neoplasia involve activation of AMP-activated protein kinase”. *Cancer Prevention Research (Philadelphia)* 1.5 (2008): 369-375.
4. Buzzai M. “Systemic treatment with the antidiabetic drug metformin selectively impairs p53-deficient tumor cell growth”. *Cancer Research* 67.14 (2007): 6745-6752.

Volume 3 Issue 4 August 2017

©All rights reserved by Mehulkumar K Kanadiya.