Association Between NAFLD/NASH and Colorectal Polyps and Neoplasms in Young Adults With Obesity: A Retrospective Study

Jarin Prasa, DO1*, Radu Grovu, MD2, Syed S. Karim, DO3, Liliane Deeb, MD2.

Staten Island University Hospital, Brooklyn, NY; 2Staten Island University Hospital, Staten Island, NY; 3NYC Health + Hospitals South Brooklyn, Glen Oaks, NY.

Introduction: Obesity, nonalcoholic fatty liver disease (NAFLD) and nonalcoholic steatohepatitis (NASH) has been associated with an increased risk of colon polyps and colorectal cancer (CRC). However, whether these patients need to be screened earlier is not well established. Therefore, we aimed to investigate the association between NAFLD/NASH and the presence of colon polyps and CRC in the young obese population.

Methods: We conducted a retrospective study using ICD-10 codes from a large cohort of 18- to 45-year-old individuals with obesity (n = 626,724) from the Nationwide Inpatient Sample (NIS) database during the years 2016-2018. Participants with a family history of CRC, inflammatory bowel disease, cystic fibrosis, or genetic susceptibility were excluded. Multivariable logistic regression was used to analyze the association between NAFLD/NASH and the presence of polyps, benign and malignant neoplasms in the colon, adjusting for age, gender, morbid obesity, HTN, nicotine dependence, obstructive sleep apnea, hyperlipidemia, and diabetes.

Results: After excluding 7,422 participants with the above exclusion criteria, the final dataset included 619,302 individuals. In the multivariate analysis, NAFLD was significantly associated with an increased risk of polyps and benign neoplasms in the colon (OR 1.98, 95% CI 1.90-2.06, P < 0.001), but not malignant neoplasms (OR 0.91). Moreover, NASH was associated with a significantly higher risk of polyps and benign neoplasms (OR 4.96, and 3.66 respectively; P < 0.001), again not with malignant neoplasms (OR 0.31). These associations were consistent across all subgroups (Table 1).

Conclusion: The study found that young patients with obesity and NAFLD were at an increased risk of developing colon polyps, and the risk further increased for those with NASH. The odds for malignant neoplasms were found to be lower in these two populations, however we believe the increased presence of polyps alone is a risk for the further development of CRC. The underlying mechanisms may involve chronic inflammation, oxidative stress, and insulin resistance which promotes the development of growth factors and polyp occurrence. Furthermore, studies indicate that individuals who have pre-existing NAFLD and obesity may have a worse prognosis when diagnosed with CRC. Hence, it may be good practice to screen young patients with obesity and NAFLD/NASH for colon polyps and cancer before the recommended age of 45. Early detection and intervention can help prevent the progression of these conditions.

Table 1. (continued)

| Variable | Negative change in intent to undergo colonoscopic CRC screening | aOR 95% CI | P |
|----------|---------------------------------------------------------------|-------------|---|
| Employment status: | | | |
| Unemployed, on disability, on leave from work, retired, or homemaker | | | |
| Employed or student | 0.82 | 0.56 - 1.20 | 0.32 |
| Has health insurance | 0.68 | 0.40 - 1.16 | 0.14 |
| Has usual source of care | 0.88 | 0.56 - 1.42 | 0.60 |
| Self-reported health status: | | | |
| Excellent | | | |
| Very good | 1.35 | 0.67 - 2.92 | 0.42 |
| Good | 1.48 | 0.75 - 3.19 | 0.28 |
| Fair/Poor | 1.41 | 0.66 - 3.21 | 0.39 |
| Number of medical comorbidities #: | | | |
| 0 | 1.20 | 0.71 - 2.02 | 0.50 |
| ≥2 | 1.30 | 0.82 - 2.09 | 0.27 |
| Political party: | | | |
| Democrat | | | |
| Independent | 0.77 | 0.48 - 1.22 | 0.26 |
| Republican | 0.96 | 0.61 - 1.49 | 0.85 |
| Other | 1.23 | 0.54 - 2.59 | 0.60 |
| Prefer not to say | 0.54 | 0.18 - 1.38 | 0.24 |
| Main source of news: | | | |
| National or cable TV news | | | |
| Local TV news | 0.91 | 0.58 - 1.44 | 0.70 |
| Newspaper | 0.47 | 0.07 - 1.66 | 0.32 |
| Online news websites | 0.94 | 0.56 - 1.55 | 0.80 |
| Social media websites | 1.83 | 1.09 - 3.05 | 0.02 |
| Other source | 0.78 | 0.22 - 2.12 | 0.66 |
| Does not read, watch, or listen to news | 0.70 | 0.30 - 1.47 | 0.38 |
| US region: | | | |
| Northeast | | | |
| South | 0.90 | 0.54 - 1.53 | 0.70 |
| Midwest | 1.28 | 0.76 - 2.19 | 0.36 |
| West | 1.63 | 0.97 - 2.78 | 0.07 |
| Has non-first degree relative or friend diagnosed with CRC | 0.81 | 0.45 - 1.36 | 0.44 |
| Believes is not susceptible to CRC | 1.79 | 1.23 - 2.57 | 0.002 |
| Believes CRC screening is not beneficial | 1.79 | 1.46 - 5.61 | 0.35 |

All the variables in the table were included in the multivariable logistic regression model. This analysis did not include people who stated before they read their assigned article that they “strongly disagree” or “disagree” with the following statement: “I plan to be screened for colon cancer with a colonoscopy.” aOR, adjusted odds ratio; CI, confidence interval; CRC, colorectal cancer.

Association Between NAFLD/NASH and Colorectal Polyps and Neoplasms in Young Adults With Obesity: A Retrospective Study

Jarin Prasa, DO1*, Radu Grovu, MD2, Syed S. Karim, DO3, Liliane Deeb, MD2.

Staten Island University Hospital, Brooklyn, NY; 2Staten Island University Hospital, Staten Island, NY; 3NYC Health + Hospitals South Brooklyn, Glen Oaks, NY.

Introduction: Obesity, nonalcoholic fatty liver disease (NAFLD) and nonalcoholic steatohepatitis (NASH) has been associated with an increased risk of colon polyps and colorectal cancer (CRC). However, whether these patients need to be screened earlier is not well established. Therefore, we aimed to investigate the association between NAFLD/NASH and the presence of colon polyps and CRC in the young obese population.

Methods: We conducted a retrospective study using ICD-10 codes from a large cohort of 18- to 45-year-old individuals with obesity (n = 626,724) from the Nationwide Inpatient Sample (NIS) database during the years 2016-2018. Participants with a family history of CRC, inflammatory bowel disease, cystic fibrosis, or genetic susceptibility were excluded. Multivariable logistic regression was used to analyze the association between NAFLD/NASH and the presence of polyps, benign and malignant neoplasms in the colon, adjusting for age, gender, morbid obesity, HTN, nicotine dependence, obstructive sleep apnea, hyperlipidemia, and diabetes.

Results: After excluding 7,422 participants with the above exclusion criteria, the final dataset included 619,302 individuals. In the multivariable analysis, NAFLD was significantly associated with an increased risk of polyps and benign neoplasms in the colon (OR 1.98, 95% CI 1.90-2.06, P < 0.001), but not malignant neoplasms (OR 0.91). Moreover, NASH was associated with a significantly higher risk of polyps and benign neoplasms (OR 4.96, and 3.66 respectively; P < 0.001), again not with malignant neoplasms (OR 0.31). These associations were consistent across all subgroups (Table 1).

Conclusion: The study found that young patients with obesity and NAFLD were at an increased risk of developing colon polyps, and the risk further increased for those with NASH. The odds for malignant neoplasms were found to be lower in these two populations, however we believe the increased presence of polyps alone is a risk for the further development of CRC. The underlying mechanisms may involve chronic inflammation, oxidative stress, and insulin resistance which promotes the development of growth factors and polyp occurrence. Furthermore, studies indicate that individuals who have pre-existing NAFLD and obesity may have a worse prognosis when diagnosed with CRC. Hence, it may be good practice to screen young patients with obesity and NAFLD/NASH for colon polyps and cancer before the recommended age of 45. Early detection and intervention can help prevent the progression of these conditions.
Table 1. Association Between NAFLD/NASH and the Presence of Polyps, Benign and Malignant Neoplasms in the Colon

| Polyps                                      | Odds Ratio | 95% Confidence Interval | P Value |
|---------------------------------------------|------------|-------------------------|---------|
| Nonalcoholic fatty liver disease (NAFLD)    | 3.18       | 2.17-4.52               | < 0.001 |
| Nonalcoholic steatohepatitis (NASH)        | 4.96       | 2.24-9.39               | < 0.001 |

Benign neoplasms

| Nonalcoholic fatty liver disease (NAFLD)    | 2.62       | 1.88-3.55               | < 0.001 |
| Nonalcoholic steatohepatitis (NASH)        | 3.66       | 1.74-6.68               | < 0.001 |

Malignant neoplasms

| Nonalcoholic fatty liver disease (NAFLD)    | 0.91       | 0.57-1.38               | 0.237   |
| Nonalcoholic steatohepatitis (NASH)        | 0.31       | 0.02-1.35               | 0.681   |

Effect of the 2018 American Cancer Society Colorectal Cancer Screening Guideline Update on Patients Presenting for Colonoscopy at an Academic Medical Center Endoscopy Unit

John Nathanson, MD1*, Gabriela Joaquin, MD2, Sydney Pomenti, MD1, Anna Krigel, MD1.

1New York Presbyterian-Columbia, New York, NY; 2Columbia University Irving Medical Center, New York, NY.

Introduction: Colonoscopy is an effective way to prevent colorectal cancer (CRC) and diagnose CRC early. Prior to 2018, guidelines recommended that most average risk patients should begin CRC screening at age 50. Since the early 2000s, CRC incidence and mortality have been decreasing for patients over the age of 50, though increasing for patients under 50. The American Cancer Society (ACS) issued a qualified recommendation in May 2018 to begin CRC screening in all average-risk adults at age 45, rather than 50. We aimed to study the demographics of those patients who presented for screening colonoscopy after the ACS issued updated guidelines in 2018.

Methods: We identified all average-risk patients who underwent colonoscopy for CRC screening using the electronic endoscopy database at an academic medical center endoscopy unit between December 2016 and February 2020. We compared the demographics of all average-risk patients who underwent screening colonoscopy between December 2016 and May 2018 to those who underwent screening colonoscopy between June 2018 and February 2020. The 2 groups were compared using chi-square tests.

Results: A total of 5,540 patients had a colonoscopy before May 2018 compared to 4,248 after May 2018. Two hundred and seventy-seven (6.5%) of patients ≤ 50 had a screening colonoscopy compared to 93 (2.6%) prior to the guidelines (P < 0.001). There was an increase in patients with commercial insurance (2446 [57.6%] vs 1864 [52.7%]) and Medicaid insurance (484 [11.4%] vs 348 [9.8%]) undergoing screening colonoscopy after May 2018 (P < 0.001). There was a significant increase in both English-speaking patients (2153 [50.7%] vs 1670 [47.2%]) and Spanish speaking patients (1278 [36.1%] vs 1432 [33.7%]) (P < 0.001) patients undergoing screening colonoscopy. There were no significant associations in patient race/ethnicity or marital status with regard to the ACS guidelines (Table 1).

Conclusion: The 2018 ACS Guideline Update on CRC screening age may have been associated with an increase in patients under age 50 (and perhaps over age 50) presenting for screening colonoscopy across demographics including sex, language, and insurance status. A higher percentage of younger patients presented for colonoscopy after the recommendations were released. More research is needed to determine who may be late adopters of more recent guidelines and need more attention from gastroenterologists and primary care providers.

Table 1. Demographics of Patients Undergoing Screening Colonoscopy Before and After 2018 ACS Guideline Update

| Before (n, %) | After (n, %) | P Value |
|---------------|-------------|---------|
| Gender        |             |         |
| Male          | 1,472 (41.6%) | 1,654 (38.9%) | 0.018 |
| Female        | 2,068 (58.4%) | 2,594 (61.1%) |
| Race / Ethnicity |         |         |
| White         | 947 (26.7%)  | 1,149 (27.0%) | 0.450 |
| Black         | 386 (10.9%)  | 508 (11.9%)   |
| Hispanic      | 1,563 (44.2%)| 1,809 (42.6%) |
| Other         | 624 (17.6%)  | 763 (18.0%)   |
| Unknown       | 20 (0.5%)    | 19 (0.4%)    |
| Primary Language |       |         |
| English       | 1,670 (47.2%)| 2,153 (50.7%) | 0.004 |
| Spanish       | 1,278 (36.1%)| 1,432 (33.7%) |
| Other         | 555 (15.7%)  | 637 (15.0%)   |
| Unknown       | 37 (1.0%)    | 26 (0.6%)    |
| Insurance     |             | < 0.0001   |
| Commercial    | 1,864 (52.7%)| 2,446 (57.6%) |
| Medicare      | 811 (23.0%)  | 906 (21.3%)   |
| Medicaid      | 348 (9.8%)   | 484 (11.4%)   |
| Other         | 514 (14.5%)  | 410 (9.6%)    |
| Marital Status|             | 0.135     |
| Single        | 1,277 (36.1%)| 1,623 (38.2%) |
| Married       | 1,670 (47.2%)| 1,980 (46.6%) |
| Divorced      | 258 (7.3%)   | 286 (6.7%)    |
| Other         | 335 (9.5%)   | 359 (8.5%)    |