Malignancies in Inflammatory Bowel Disease Patients – a population-based study of the last two decades

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INTRODUCTION AND BACKGROUND

- Inflammatory Bowel Disease (IBD) is a chronic inflammatory disorder of the gut. IBD prevalence is estimated to be more than 3 million in the USA.
- Many studies suggest that IBD patients have an increased risk of developing intestinal and extraintestinal malignancies. IBD-related inflammation and carcinogenic properties of immunosuppressive drugs are the main culprits of initiation and progression of tumor formation.

STUDY AIM

- This study aimed to analyze the nationwide prevalence of malignant neoplasms in IBD patients.

METHODS

- NIS database was queried from January 2000 to December 2019 to retrieve records of patients admitted with a principal or secondary diagnosis of IBD.
- We compared the incidence of malignant neoplasms in IBD (cases) to patients who did not have IBD (controls).
- Controls were 1:1 fixed ratio nearest neighbor (greedy) propensity score-matched using the patient's age, sex, and race.
- We used ICD codes to identify the spectrum of malignant neoplasms.
- We performed univariate logistic regression to calculate the odds ratio. Statistical analysis is performed in R (Studio 1.4).
- The p-values of < 0.01 were considered to be significant.

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TABLES

Table 1: Prevalence of malignant Neoplasms in IBD vs age-, sex-, and race-matched non-IBD patients National Inpatient Sample 2000 - 2019

Variables	IBD = No (n= 1,108,914) 50%	IBD = Yes (n= 1,109,008) 50%	OR (99%CI)	P value
Head and Neck	3413 (0.31%)	2186 (0.06%)	0.64 (0.60– 0.69)	<.0001
Esophagus	1314 (0.12%)	714 (0.06%)	0.54 (0.48 – 0.59)	<.0001
Stomach	1450 (0.13%)	1146 (0.10%)	0.79 (0.71– 0.87)	<.0001
Small Intestine	264 (0.02%)	1161 (0.10%)	4.40 (3.69– 5.25)	<.0001
Colorectal	11758 (1.06%)	15163 (1.37%)	1.29 (1.25– 1.33)	<.0001
Liver	1379 (0.12%)	1472 (0.13%)	NA	0.0818
Bile Duct	265 (0.02%)	1052 (0.09%)	3.97 (3.32 – 4.74)	<.0001
Respiratory	15699 (1.42 %)	10791 (0.97 %)	0.68 (0.66– 0.71)	<.0001
Bone	1666 (0.15%)	694 (0.06%)	0.41 (0.37 – 0.47)	<.0001
Skin	8554 (0.77%)	13797 (1.24%)	1.62 (1.57 – 1.68)	<.0001
Breast	21129 (1.91%)	17994 (1.62%)	0.85 (0.83– 0.87)	<.0001
Urinary	9092 (0.82%)	9913 (0.89%)	1.09 (1.05 – 1.13)	<.0001
Nervous System	2135 (0.19%)	1277 (0.12%)	0.60 (0.55 – 0.65)	<.0001
Lymphoma	8311 (0.75%)	8110 (0.73%)	NA	0.1141
Leukemia	6174 (0.56%)	6142 (0.55%)	NA	0.7689
Myeloma	2314 (0.21%)	1890 (0.17%)	0.82 (0.75– 0.88)	<.0001
Myelodysplastic Syndrome	1394 (0.13%)	2316 (0.21%)	1.66 (1.52– 1.81)	<.0001
Anus	3716 (0.34%)	6074 (0.55%)	1.64 (1.55– 1.73)	<.0001
Uterus	3433 (0.31%)	3236 (0.29%)	NA	0.0155
Cervix	3849 (0.35%)	3818 (0.34%)	NA	0.7201
Ovary	3276 (0.30%)	2577 (0.23%)	0.79 (0.74– 0.84)	<.0001
Prostate	12489 (1.13 %)	14109 (1.27 %)	1.13 (1.10– 1.17)	<.0001
Testis	1073 (0.10%)	787 (0.07%)	0.73 (0.65 – 0.83)	<.0001
Thyroid	2472 (0.22%)	2650 (0.24%)	NA	0.0129
Pancreas	2259 (0.20%)	1880 (0.17%)	0.83 (0.76– 0.90)	<.0001
Neuroendocrine Tumors	536 (0.11%)	618 (0.06%)	NA	0.0158

RESULTS

- A total of 1,109,008 records were identified with IBD.

- IBD patients have an increased risk of some cancers, including
  o **Small intestine Bile duct**
  o **Myelodysplastic Syndrome**
  o **Anus**
  o **Skin**
  o **Colorectal**
  o **Urinary**
  o **Prostate**

- IBD patients are at low risk of some cancers, including
  o **Head and Neck**
  o **Esophagus**
  o **Stomach**
  o **Respiratory**
  o **Bone**
  o **Breast**
  o **Nervous System**
  o **Myeloma**
  o **Ovary**
  o **Testis**
  o **Pancreas.**

LIMITATIONS

- The NIS does not identify individual patients, and recurrent hospitalizations appear as distinct observations.
- Inherent design flaws of administrative databases.
- Coding errors when combining ICD 9 with ICD 10.
- No information on the severity of IBD.
- No information on outpatient data
- No information on treated vs non-treated patients.

LEARNING POINTS

- IBD and malignancies have been discussed in the past. Despite these efforts, much remains unknown regarding the increased risk of cancers in IBD.
- Our results showed that IBD patients are at increased risk of certain neoplasms, particularly small bowel, bile duct, and myelodysplastic syndrome.
- Although inflammatory injury and immunosuppression can play a role in carcinogenesis, we still know little about the risk factors contributing to neoplasms.
- Therefore, more studies are needed to determine the risk factor and mechanism for developing malignancies in IBD patients.