

Background

Inflammatory Bowel Disease (IBD) patients have an established higher risk of Venous Thromboembolism, including Pulmonary Embolism (PE), secondary to chronic inflammatory state. However, Impact of IBD on the prognosis of admitted PE patients remains unstudied. Therefore, authors aim to investigate outcomes of hospitalized PE patients in the setting of IBD.

Methods and Materials

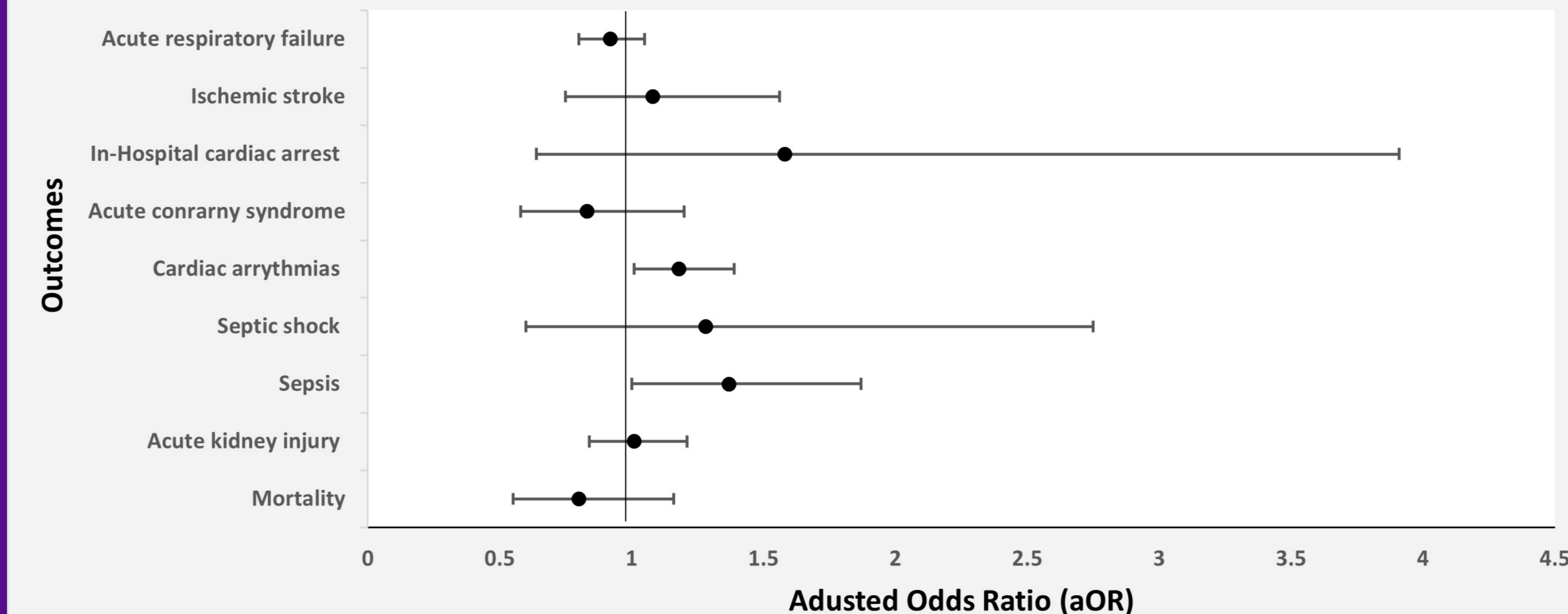
Using International Classification of Diseases Tenth Revision (ICD-10) codes, the National Inpatient Sample database of the years 2016 to 2019 was searched for patients admitted with a primary diagnosis of PE, with and without a past medical history of IBD listed as secondary diagnosis. Univariate and Multivariate logistic regression analysis was performed to determine the risk of mortality and in-hospital complications in PE/IBD group compared to PE/non-IBD group. Baseline patients and facilities characteristics were incorporated into the analysis. Data was considered statistically significant if p-value was < 0.05.

Results

Among 750,654 adults' patients who were hospitalized in US with a primary diagnosis of PE from 2016 - 2019, 6,995 (1%) had a secondary diagnosis of IBD. Patients baseline characteristics are listed in Table 1. After running multivariate regression analysis, history of IBD was not associated with mortality difference in PE patients (aOR 0.80, p=0.245). In term of in-hospital outcomes (Figure 1), IBD/PE patients had an increased risk of cardiac arrhythmias (aOR 1.18, p= 0.035) and sepsis (aOR 1.37, p=0.048), with no significant difference in risk of acute kidney injury (aOR 1.01, p=0.882), septic shock (aOR 1.28, p=0.516), acute coronary syndrome (aOR 0.83, p=0.337), acute respiratory failure (aOR 0.92, p=0.244) and in-hospital cardiac arrest (aOR 2.24, p=0.319). IBD/PE group had a prolonged length of stay (aMD 0.56 days, p=< 0.001) and increased cost of care (aMD 4093\$, p=0.023) when compared to admitted PE patients who are IBD-free.

VARIABLE	OVERALL, PE %, No.	WITHOUT IBD %, No.	WITH IBD %, No.	P value
PATIENT'S CHARACTERISTICS	100.0 (750,654)	99.0 (743659)	1.00 (6995)	
AGE, MEAN YEARS	62.8	62.9	58.8 ()	< 0.001
FEMALE	51.9 (389589)	51.9 (385959)	55.1 (3854)	< 0.001
RACIAL DISTRIBUTION				< 0.001
WHITE	71.6 (537468)	71.5 (531716)	83.3 (5827)	
BLACK	18.9 (141874)	19.0 (141295)	11.2 (783)	
HISPANIC	5.83 (43763)	5.87 (43653)	2.73 (191)	
OTHERS	2.10 (15764)	2.10 (15617)	1.92 (134)	
INSURANCE TYPE				< 0.001
MEDICAID	53.6 (402351)	53.7 (399345)	47.6 (3330)	
MEDICARE	12.3 (92330)	12.4 (92214)	10.8 (755)	
PRIVATE	29.8 (223695)	29.7 (220867)	39.2 (2742)	
UNINSURED	4.06 (30477)	4.09 (30416)	2.27 (159)	
CHARLSON COMORBIDITY INDEX SCORE				< 0.001
1	23.3 (174902)	23.3 (173273)	24.1 (1686)	
2	16.5 (123858)	16.5 (122704)	16.7 (1168)	
≥3	29.3 (219942)	29.4 (218636)	22.5 (1574)	
MEDIAN ANNUAL INCOME, US\$				< 0.001
1-43,999	28.5 (213936)	28.5 (211943)	22.0 (1539)	
44,000-55,999	26.5 (198923)	26.5 (197070)	25.8 (1805)	
56,000-73,999	24.8 (186162)	24.8 (184427)	26.8 (1875)	
≥74,000	20.0 (150131)	20.0 (148732)	25.3 (1770)	
HOSPITAL CHARACTERISTICS				< 0.001
HOSPITAL REGION				< 0.001
NORTHEAST	18.0 (135118)	18.5 (137577)	20.8 (1455)	
MIDWEST	25.2 (189165)	25.1 (186658)	27.0 (1889)	
SOUTH	38.8 (291254)	38.8 (288540)	34.6 (2420)	
WEST	17.8 (133616)	17.8 (132371)	17.5 (1224)	
HOSPITAL BED SIZE				0.8425
SMALL	21.0 (157637)	21.0 (156168)	21.5 (1504)	
MEDIUM	29.6 (222194)	29.6 (220123)	29.8 (2085)	
LARGE	49.3 (370072)	49.3 (366624)	48.6 (3400)	
HOSPITAL LOCATION				< 0.001
RURAL LOCATION	9.55 (71687)	9.57 (71168)	7.72 (540)	
URBAN LOCATION	22.7 (170398)	22.8 (169554)	18.6 (1301)	
TEACHING HOSPITAL	67.6 (507442)	6.76 (50271)	73.6 (5148)	
COMORBIDITIES				< 0.001
HYPERTENSION	42.3 (317527)	42.3 (314568)	35.6 (2490)	< 0.001
DIABETES MELLITUS	23.2 (174152)	23.3 (173273)	16.3 (1140)	< 0.001
SMOKING HISTORY	38.7 (290503)	38.7 (287796)	39.6 (2770)	0.8226
HYPERLIPIDEMIA	35.9 (269485)	36.0 (267717)	27.8 (1945)	< 0.001
OBESITY	25.4 (190666)	25.5 (189633)	19.8 (1385)	< 0.001
CHRONIC KIDNEY DISEASE	12.7 (95333)	12.7 (94445)	10.2 (713)	< 0.001
CORONARY ARTERY DISEASE	21 (157637)	17.5 (130140)	14.3 (1000)	< 0.001
PERIPHERAL VASCULAR DISEASE	21.5 (161391)	2.16 (16063)	1.86 (130)	0.2200
CONGESTIVE HEART FAILURE	16.5 (123858)	16.5 (122704)	972	< 0.001
CHRONIC OBSTRUCTIVE LUNG DISEASE	18.3 (137370)	18.3 (136090)	17.1 (1196)	0.0053
CHRONIC LIVER DISEASE	4.68 (35131)	4.67 (34729)	6.65 (465)	< 0.001
CORTICOSTEROID USE	4.13 (31002)	4.07 (30267)	11.8 (825)	< 0.001

Forest plot of study outcomes



Conclusion

Our study demonstrates that patients with PE have a slightly worse in-hospital outcomes in the setting of IBD, represented by increased risk of sepsis and cardiac arrhythmias, and prolonged length of stay and healthcare resources utilizations. Further studies are needed to validate our findings, to prompt proper risk satisfaction and for IBD patients who are admitted with PE in a goal to reduce the incidence of the before mentioned outcomes and to reduce healthcare resources utilization in this group of patients.

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