Clinical Outcomes and Resource Utilization Analysis in Patients with Rheumatoid Arthritis Undergoing Endoscopic Retrograde Cholangiopancreatography: A Nationwide Inpatient Sample Analysis

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Background

Rheumatoid Arthritis (RA) is an autoimmune disease that is characterized by a high inflammatory state and often associated with biliary/pancreatic disease. The literature is deficient on the associations of ERCP related outcomes and complications in RA patients. This study aims to evaluate the effects of RA on clinical outcomes, and hospital resource utilization in patients undergoing ERCP.

Method

The NIS database was used to identify hospitalized patients who had an ERCP study from 2012-2014 using ICD-9 codes and split into those with and without RA. Primary outcomes were mortality, hospital charges, and length of stay (LOS). Secondary outcomes were ERCP related complications. Chi squared tests for categorical data and independent T test for continuous data were used to compare the outcomes between the two groups. Multivariate analysis was performed to assess the primary outcomes after adjusting for confounding variables.

Results

There was a total of 83,890 ERCP from 2012-2014, of which 970 patients had RA. In patients with RA who had an ERCP procedure, 720 (74.2%) were female and the average age was 65.7. The primary outcomes of mortality rate and hospital cost were statistically significant. RA LOS days were less than those without RA, though not statistically significant. RA average LOS was 7.21 days vs 7.91 control, RA mortality rate was 1.0% vs 2.3% control, and RA average hospital charges was $67,160 vs $77,684.85 in the control. There was no statistical significance in the secondary outcomes.

Conclusion

With a high inflammatory state, it was hypothesized that RA would be associated with higher rates of complications and worse outcomes. Yet, the primary outcomes were found to be lower than the general population, and no difference in secondary outcomes. One explanation for such findings may be that immunosuppressants used to treat RA provides a protective effect to overall complications with ERCP.

Table 1: Demographics and Resource Utilization of ERCP Patients, With and Without Rheumatoid Arthritis

	ERCP Without RA N=82,920	ERCP With RA N=970	P-Value	95% CI
Mean Age (years)	59.9 (18.8 SD)	65.7 (13.8 SD)	**<0.05**	(-7.1) – (-4.7)
Sex			**<0.05**	
Female	46,100 (55.6 %)	720 (74.2%)		
Male	36,820 (44.4%)	250 (25.8%)		
Race			**<0.05**	
White	51,910 (69.9%)	690 (74.6%)		
Black	9,265 (11.7%)	85 (9.2%)		
Hispanic	11,160 (14.2%)	105 (11.4%)		
Asian or Pacific Islander	2,970 (3.8%)	10 (1.1%)		
Native American	440 (0.5%)	20 (2.2%)		
Others	2,960 (0.4%)	15 (1.6%)		
Primary Payer			**<0.05**	
Medicare	38,930 (47.0%)	665 (68.6%)		
Medicaid	12,095 (14.6%)	80 (8.2%)		
Private Insurance	23,970 (29.0%)	190 (19.6%)		
Self-pay	4,595 (5.6%)	20 (2.1%)		
Others	3,175 (3.8%)	15 (1.5%)		
Median household income			**<0.05**	
Lowest quartile	22,515 (27.8%)	250 (26.5%)		
Second quartile	21,105 (26.1%)	220 (23.3%)		
Third quartile	200,85 (24.8%)	240 (25.4%)		
Highest quartile	17,230 (21.3%)	235 (24.9%)		
Length of Stay in Days	7.91 (10.1 SD)	7.21 (6.9 SD)	<0.05	.065-1.34
Total charges	$77,684.85 (107,984 SD)	$67,160 (78,875 SD)	< 0.05	3620-17,428
Charlson Comorbidity Index	3.3 (2.7 SD)	4.6 (2.1 SD)	<0.05	(-1.46) – (-1.11)

Table 2: Clinical Outcomes in ERCP Patients With and Without Rheumatoid Arthritis

	ERCP Without RA N=82,920	ERCP With RA N=970	P-Value	Adjusted Odds Ratio (95% CI)
GI bleed	870 (0.7%)	5 (0.5%)	0.10	0.48 (0.20-1.18)
Perforation	210 (0.3%)	0 (0.0%)	0.26	0.20 (0.01-3.25)
Abscess	90 (0.1%)	0 (0.0%)	0.60	0.47 (0.03-7.60)
Pancreatitis	23,865 (28.8%)	270 (27.8%)	0.52	1.17 (1.17-1.34)
Stricture	20,630 (24.9%)	260 (26.8%)	0.17	0.96 (0.83-1.11)
Fistula	170 (0.2%)	0 (0%)	0.33	0.25 (0.02-4.02)
Sepsis	11,145 (13.4%)	160 (16.5%)	<0.05	1.11 (0.93-1.32)
In-Patient Mortality	1,920 (2.3%)	10 (1.0%)	<0.05	0.38 (0.20-0.71)

CI- Confidence Interval, ERCP- Endoscopic Retrograde Cholangiopancreatography, RA- Rheumatoid Arthritis