Assessment of Mortality among Patients having Colorectal Cancer and Atrial Fibrillation

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Introduction:

Atrial Fibrillation (AFib) is the most common persistent cardiac arrhythmia, occurring in about 1% of the general population and Colorectal cancer (CRC) is the fourth most diagnosed cancer in the world. Although, there is well-established literature assessing the relationship of patients with cancer and AFib, very few studies have depicted the relationship between CRC and AFib. Our study aims to assess the effect of AFib on the mortality among CRC patients.

Method:

In this retrospective analysis, National Inpatient Sample (NIS) data from 10/2015 to 12/2017 was used which include 245,305 patients in this study. Demographic characteristics and clinical outcomes were compared among patients diagnosed with CRC with and without AFib. Bivariate analyses were performed using the chi-squared test or Fisher exact test (2-tailed) for categorical variables as appropriate, to assess the differences in the two groups.

Result:

Patients who had CRC and AFib had 1.71 (95% CI: 1.45-2.02) higher odds of mortality compared with those without AFib. After propensity score matching was done on demographics and clinical factors, there was still 1.44 (95%CI: 1.18-1.75) times higher probability of mortality in AFib patient. Additionally, CRC with AFib had significantly prolonged hospitalization and cost. Secondary outcome analysis showed that AFib associate with high odds of sepsis (OR: 1.45, 95%CI: 1.30-1.62), AKI (OR: 1.45, 95%CI: 1.30-1.62), lower GI bleeding (OR: 1.31, 95%CI: 1.21-1.43)) and respiratory failure (OR: 1.39, 95%CI: 1.15-1.67)) after the propensity match. Interestingly, females had 25% lower odds of predictive mortality compared with males who were diagnosed with colorectal cancer and AFib (95%CI: 0.58-0.97) In addition, subjects who had CCI of 2 had 65% lower odds of mortality (95%CI: 0.22-0.55) comparing with CCS of 3 or more.

DIED	Univariate Analysis		Non-Propensity Matched		Propensity Matched	
Co-Morbidity	OR (95%-CI)	P-Value	OR (95%-CI)	P-Value	OR (95%-CI)	P-Value
A.Fib	2.04 (1.77-2.36)	<0.001	1.71(1.45-2.02)	<0.000	1.44 (1.18-1.75)	<0.001

Table: Multivariate Non-propensity and Propensity matched analysis showing effect of Afib on mortality in patient with Colorectal Cancer

	Predictors of mortality in CRC with Afib	
Predictors	OR (95% CI)	P value
Female	0.75(0.58-0.97)	0.028
Race (Black)	1.04(0.63-1.73)	0.868
Race (Hispanic)	1.37(0.80-2.35)	0.245
Race (Asian)	0.66(0.20-2.18)	0.501
CCS score of 2	0.35(0.22-0.55)	0.001

Table: Predictors of mortality in Patient with Colorectal cancer and A.Fib

Variable	CRC w/o A.Fib	CRC w/ A.Fib	P Value	OR(CI) P value: non-propensity matched	OR(CI) P value: propensity matched
Sepsis	5971(2.75)	1741(6.18)	<0.001	2.14(1.84-2.49) <0.001	1.45(1.30-1.62)<0.001
Mechanical Ventilation	2823(1.3)	1070(3.8)	<0.001	2.21(1.81-2.69) <0.001	1.38(1.11-1.72)0.004
Pressure Support	565(0.26)	220(0.78)	<0.001	2.39(1.56-3.67) <0.001	1.96(1.18-3.26)0.01
ACS	1303(0.6)	535(1.9)	<0.001	1.37(1.04-1.80) 0.024	1.29(0.95-1.77) 0.104
Hemorrhage Requiring BT	25535(11.76)	5335(18.94)	<0.001	1.28(1.18-1.40) <0.001	1.17(1.05-1.29)0.003
VTE	2280(1.05)	516(1.83)	<0.001	1.51(1.15-1.99) 0.003	1.34(0.97-1.84) 0.077
Lower GI bleed	54609(25.15)	11265(39.99)	<0.001	1.46(1.37-1.56) <0.001	1.31(1.21-1.43)<0.001
Intestinal Obstruction	17132(7.89)	2459(8.73)	0.030	1.12(1.00-1.26) 0.045	1.08(0.94-1.24)0.295
AKI	20172(9.29)	5899(20.94)	<0.001	1.64(1.50-1.79) <0.001	1.45(1.30-1.62) <0.001
Respiratory Failure	4625(2.13)	1580(5.61)	<0.001	1.87(1.60-2.19) <0.001	1.39(1.15-1.67)0.001

Table: Multivariate Non-propensity and Propensity matched analysis showing effect of Afib on secondary outcome in patient with Colorectal Cancer

Discussion:

Several studies have demonstrated that AFib is more common among CRC patient. With growing cancer burden and the high incident of AFib, it becomes important to study the effect of AFib on CRC mortality. As we found here, that AFib associate with 1.4 time higher odds of mortality in CRC patients after propensity match. Interestingly, higher odds of other complications such as sepsis, AKI, Respiratory failture and GI bleeding was also found in CRC patients with AFib, which could be the cause of higher mortality rate in AFib patient. Therefore, AFib could become a good indicator for the mortality in CRC patient.

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