



Cardiovascular Diseases in Celiac Disease Patients

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INTRODUCTION AND BACKGROUND

- Celiac disease (CD) is a common immune-mediated disease of the small bowel caused by exposure to gluten in genetically sensitive individuals.
- CD is associated with a modestly increased risk of cardiovascular diseases, but the evidence base is limited.

STUDY AIM

- In this study, we aimed to analyze the prevalence of cardiovascular diseases in CD patients.

METHODS

- NIS database was queried from September 2015 to 2019 to retrieve records of patients admitted with a principal or secondary diagnosis of CD.
- We compared the incidence of cardiovascular diseases in CD (cases) to patients who did not have CD (controls). Controls were 1:1 fixed ratio nearest neighbor (greedy) propensity score-matched using the patient's age, sex, and race.
- We used clinical classification software refined (CCSR) for ICD-10-CM diagnosis v2021 and identified a spectrum of cardiovascular diseases.
- We used the Rao-Scott chi-square test on the weighted sample. We used alpha = 0.01 and P value < 0.001 considered statistically significant.
- Statistical analysis is performed in R (Studio 1.4).

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TABLES

Table 1: Prevalence of Cardiovascular Diseases in CD vs age-, sex-, race- matched non-CD patients, Weighted NIS 2015Q4 to 2019.

Variables	CD = No (n= 178584) 50%	CD = Yes (n= 178590) 50%	OR (99%CI)	P value
Cardiac and circulatory congenital anomalies	819 (0.46%)	1915 (1.07%)	2.34 (1.83 – 3.01)	<.0001
Chronic rheumatic heart disease	2300 (1.29%)	3385 (1.89%)	1.48 (1.25 – 1.76)	<.0001
Endocarditis and endocardial disease	460 (0.26%)	515 (0.29%)	NA	0.4468
Myocarditis and cardiomyopathy	5525 (3.10%)	6410 (3.59%)	1.17 (1.04 – 1.31)	0.0008
Pericarditis and pericardial disease	745 (0.42%)	1265 (0.71%)	1.70 (1.29 – 2.24)	<.0001
Essential hypertension	57753 (32.3%)	53330 (29.9%)	0.89 (0.85 – 0.94)	<.0001
Acute myocardial infarction	4465 (2.50%)	4135 (2.32%)	NA	0.1410
Coronary atherosclerosis and other heart disease	28964 (16.2%)	29915 (16.8%)	NA	0.1196
Acute pulmonary embolism	1905 (1.07%)	1909 (1.08%)	NA	0.8876
Pulmonary heart disease	4800 (2.69%)	5605 (3.14%)	1.17 (1.04 – 1.33)	0.0008
Conduction disorders	7445 (4.17%)	9710 (5.43%)	1.32 (1.20 – 1.45)	<.0001
Cardiac dysrhythmias	24389 (13.7%)	26990 (15.1%)	1.13 (1.06 – 1.20)	<.0001
Cardiac arrest and ventricular fibrillation	864 (0.48%)	685 (0.38%)	NA	0.0383
Heart failure	24919 (14.0%)	20100 (11.3%)	0.78 (0.73 – 0.84)	<.0001
Cerebral infarction	2825 (1.58%)	2725 (1.53%)	NA	0.5653
Acute hemorrhagic cerebrovascular disease	450 (0.25%)	890 (0.49%)	1.98 (1.42 – 2.75)	<.0001
Occlusion or stenosis of precerebral or cerebral arteries without infarction	1490 (0.83%)	2025 (1.14%)	1.36 (1.10 – 1.68)	0.0001
Peripheral and visceral vascular disease	6610 (3.70%)	11045 (6.19%)	1.71 (1.55 – 1.89)	<.0001
Hypotension	7470 (4.19%)	10975 (6.14%)	1.50 (1.37 – 1.65)	<.0001
Acute phlebitis; thrombophlebitis and thromboembolism	2435 (1.36%)	3580 (2.00%)	1.48 (1.27 – 1.73)	<.0001
Chronic phlebitis; thrombophlebitis and thromboembolism	625 (0.19 %)	335 (0.35%)	1.87 (1.26 – 2.76)	<.0001
Vasculitis	365 (0.20 %)	870 (0.49%)	2.39 (1.66 – 3.43)	<.0001

RESULTS

A total of 178,590 records were identified with CD in the weighted sample.

Compared to non-CD matched patients, CD patients have an increased prevalence of the following cardiovascular diseases:

- **Conduction disorders**
- **Cardiac dysrhythmias**
- **Circulatory congenital anomalies**
- **Vasculitis**
- **Acute hemorrhagic cerebrovascular disease**
- **Chronic phlebitis**
- **Peripheral and visceral vascular disease**
- **Pericarditis and pericardial disease**
- **Chronic rheumatic heart disease**
- **Hypotension**
- **Acute phlebitis**

CD patients are at low risk of the following:

- **Essential hypertension**
- **Heart failure**

LIMITATIONS

- The NIS does not identify individual patients, and recurrent hospitalizations appear as distinct observations.
- Inherent design flaws of administrative databases.
- No information on celiac serology or biopsy results
- No information on Gluten compliance

LEARNING POINTS

- Our study showed that CD patients are an increased likelihood of some cardiovascular diseases, however little is known about the risk factors and pathogenesis.
- Therefore, more studies are needed to determine the risk factor and mechanisms for developing cardiovascular diseases in CD patients.