

Beta Blocker Prescription After Acute MI Might Not Reduce Rate of Subsequent MIs

Team A: Tom Elliott, MPharm GPhC; Joe Deckert, PhD

Team B: Kersten Bartelt, RN; Alex Piff

Last updated 6 June 2023 • Check for updates at EpicResearch.org

Key Findings:

- Most patients (80.5%) are prescribed a beta blocker after having their first myocardial infarction (MI).
- After having an initial MI, patients who received a beta blocker prescription were 16.5% more likely to have a subsequent MI within the next year than patients who did not receive a beta blocker prescription.

Beta blockers are a standard of care for patients who have experienced an acute myocardial infarction.¹ However, it is unclear how often beta blockers are prescribed after an MI and how effective they are in preventing subsequent MIs in the real world because clinical trials have had mixed results.²⁻⁴ We analyzed data from 262,972 patients who experienced their first MI between 2018 and 2023 to determine the incidence of a subsequent MI and whether the risk of subsequent MI was influenced by a beta blocker prescription.

We found that across all demographic groups, 80.5% of patients were prescribed beta blockers within 30 days of their first MI, as seen in Figure 1. Male patients were 6.5% more likely to be prescribed beta blockers than female patients. White patients were 3.4% more likely than Black patients and 2.7% more likely than Hispanic patients to be prescribed beta blockers.

Beta Blocker Prescription Rate After Initial MI



"Beta Blocker Prescription Rate After Initial MI," 2023. EpicResearch.org

Figure 1. Percent of patients prescribed a beta blocker after their first MI by sex and race/ethnicity.

Next, we analyzed whether beta blockers might prevent a subsequent MI. We found that across all demographic groups, those prescribed beta blockers were 16.5% more likely to have a subsequent MI within a year of their initial MI than patients who were not prescribed beta blockers, as seen in Figure 2. These findings held true even when evaluating across patient sex, race, and ethnicity.

Black patients are the most likely to experience a subsequent MI with or without a beta blocker prescription, compared to White or Hispanic patients.

Subsequent MI Rate by Beta Blocker Prescription



n=262,972

"Subsequent MI Rate by Beta Blocker Prescription," 2023. EpicResearch.org

Figure 2. Percent of patients who had a subsequent MI stratified by beta blocker prescription, sex, and race/ethnicity.

While the results of this study suggest that beta blockers might not be as effective at preventing subsequent MIs as previously thought, further evaluation is needed because our study did not assess the dosage or duration of beta blocker therapy or the medication adherence of the patients, which might have an impact on the medication's effectiveness.⁵ Additionally, providers might decide to prescribe beta blockers more frequently for patients who already have a higher risk of a subsequent MI.

These data come from Cosmos, a HIPAA-defined Limited Data Set of more than 190 million patients from 200 Epic organizations including 1,147 hospitals and more than 25,000 clinics, serving patients in all 50 states and Lebanon. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions.

References

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Data Definitions

Term	Definition
Study period	1/1/2018 - 3/8/2023
Study population	Patients aged 17 or older with no history of myocardial infarction before the study period who had a face-to-face encounter at least a year after the first myocardial infarction.
Beta blockers	Prescription for a medication with a pharmaceutical class of beta blocker within 30 days of a patient's first myocardial infarction diagnosis.
First myocardial infarction diagnosis	An encounter or billing diagnosis with ICD-10-CM code I21*
Subsequent myocardial infarction diagnosis	An encounter or billing diagnosis with ICD-10-CM code I21* or I22* between 30 days and 1 year after a patient's first myocardial infarction diagnosis.
Type 2 diabetes diagnosis	An encounter or billing diagnosis with SNOMED code 44054006
Hypertension diagnosis	An encounter or billing diagnosis with ICD-10-CM codes I10*, I11*, I12*, I13*, or I15*
Hyperlipidemia diagnosis	An encounter or billing diagnosis with ICD-10-CM code E78*

Table 1: Subsequent MI by Beta Blocker Prescription and Sex

Sex	Count	Beta Blocker Count	No Beta Blocker Count	Prescribed Beta Blocker (%)	Beta Blocker MI Count	Beta Blocker MI Rate	Lower CI	Upper CI	No Beta Blocker MI Count	No Beta Blocker MI Rate	Lower CI	Upper CI
Overall	262,972	211,732	51,240	80.52%	15,893	0.075	0.074	0.076	3,301	0.064	0.062	0.066
Male	148,871	123,107	25,764	82.69%	9,137	0.074	0.073	0.076	1,704	0.066	0.063	0.069
Female	114,093	88,619	25,474	77.67%	6,755	0.076	0.074	0.078	1,597	0.063	0.060	0.066

Table 2: Subsequent MI by Beta Blocker Prescription and Race/Ethnicity

Sex	Count	Beta Blocker Count	No Beta Blocker Count	Prescribed Beta Blocker (%)	Beta Blocker MI Count	Beta Blocker MI Rate	Lower CI	Upper CI	No Beta Blocker MI Count	No Beta Blocker MI Rate	Lower CI	Upper CI
White	199,705	161,835	37,870	81.0%	11,320	0.070	0.069	0.071	2,339	0.062	0.059	0.064
Black	34,230	26,815	7,415	78.3%	2,664	0.099	0.096	0.103	578	0.078	0.072	0.084
Hispanic	12,795	10,092	2,703	78.9%	873	0.087	0.081	0.092	181	0.067	0.058	0.077
Asian	4,137	3,395	742	82.1%	252	0.074	0.066	0.084	43	0.058	0.043	0.077
Other Race	1,461	1,185	276	81.1%	77	0.065	0.052	0.080	18	0.065	0.042	0.101
American Indian or Alaska Native	1,124	913	211	81.2%	104	0.114	0.095	0.136	16	0.076	0.047	0.120
Native Hawaiian or Other Pacific Islander	599	494	105	82.5%	54	0.109	0.085	0.140	8	0.076	0.039	0.143