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Disparities in the Use of Guideline-Based Pharmacotherapy Exist for Atherosclerotic Cardiovascular Disease and Heart Failure Patients Who Have Intellectual/Developmental Disabilities in a Commercially Insured Database

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Abstract

Background: Patients who have intellectual/developmental disabilities (IDDs) develop atherosclerotic cardiovascular disease (ASCVD) or heart failure (HF) at rates similar to or higher than the general population. They also face disparities accessing and using health care services.

Objective: To determine if disparities exist in the use of guideline-based pharmacotherapy (GBP) for ASCVD or HF for adults with IDD.

Methods: Using the 2014 Clinformatics Data Mart Database, adults with ASCVD or HF were divided into IDD or non-IDD groups. Patients with contraindications for GBP medications were excluded. Use of GBP between IDD and non-IDD groups was examined. Subgroup analysis included comparisons between IDD groups.

Results: For HF, 1011 patients with IDD and 236,638 non-IDD patients were identified. For ASCVD, 2190 IDD and 790,343 non-IDD patients were identified. We found that 47.9%, 35.8%, and 13.1% of IDD and 58.7%, 48.4%, and 18.9% of non-IDD patients had pharmacy claims for statins ($P < 0.001$), β -blockers ($P < 0.001$), or antiplatelet therapy ($P < 0.001$), respectively. For HF, 46.8% and 50.3% of IDD and 59.8% and 55.4% of non-IDD patients had pharmacy claims for β -blockers ($P < 0.001$) and angiotensin-converting enzyme (ACE) inhibitors or angiotensin-receptor blockers (ARBs; $P = 0.003$), respectively. In all but one multivariate regression models patients with IDD were less likely to use GBP than patients in the non-IDD group. Subgroup analysis revealed that patients who had Down syndrome had lower GBP use in 4 of the 5 measures.

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Declaration of Conflicting Interests

The authors declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Steven Erickson, no conflicts exist; Tanima Basu, no conflicts exist. Neil Kamdar: consultant with Stanford University—significant level; Department of Surgery; Consultant with Lucent Surgical—modest level; consultant with Western University of Health Sciences—modest level.

Supplemental Material

Supplemental material for this article is available online.

Conclusion and Relevance: Disparities exist in the use of GBP for patients with IDD with ASCVD or HF. Patients who have an IDD should be examined by clinicians to ensure appropriate access to and use of GBP.

Keywords

prescribing patterns; cardiovascular drugs; pharmacoepidemiology; clinical practice guidelines; adult medicine

Introduction

Patients who have intellectual or developmental disabilities (IDDs), such as Down syndrome, autism spectrum disorders, or cerebral palsy, are living longer than in decades past and now develop chronic illness similar to the general population. Intellectual disability is a disability characterized by significant limitations in both intellectual functioning and in adaptive behavior, which covers many everyday social and practical skills.¹ This disability originates before the age of 18 years. Developmental disabilities are severe chronic disabilities that can be cognitive or physical or both. The disabilities appear before the age of 22 years and are likely to be lifelong. Some developmental disabilities are largely physical issues, such as cerebral palsy or epilepsy, whereas others may have a condition that includes a physical and intellectual disability, for example Down syndrome or fetal alcohol syndrome.²

As this population ages, individuals develop many diseases associated with aging, including atherosclerotic cardiovascular (ASCVD) and heart failure (HF).^{3–8} Cardiovascular risk factors occur similarly in patients who have IDD compared with the general population and, in some syndromes, are more prevalent. For example, people who have cerebral palsy or autism spectrum disorder are noted to have higher prevalence of cardiovascular risk factors.^{4,9}

Guideline-based pharmacotherapy (GBP) is recommended for people who have ASCVD as well as HF. Angiotensin-converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARBs), and β -blockers are considered first-line medication management for many types of HF.^{10,11} For patients with ASCVD, medication therapy with statins, antiplatelet agents, and β -blockers are indicated, along with intervening to control hypertension and diabetes.¹² Studies have examined the use of evidence or GBP for the treatment of ASCVD and HF using various nationally representative data sets.^{13–15} In elderly patients, underutilization or suboptimal use of medication for cardiovascular disease appear to be somewhat common and may be related to presence of frailty, comorbidity, or other unknown causes.^{16–18} As for adults who have IDD, there is a lack of research examining the use of evidence-based therapies for ASCVD and HF. A small university-based single-center study, found that the use of medication therapy for conditions associated with cardiovascular risk factors was similar between patients who have IDD and the general population who also had the same risk factors.¹⁹ Another study found the opposite, with lower prevalence of use of cardiovascular medications in adults with IDD than the general population.²⁰ Of note, this study did not link use of medications to an existing diagnosis. Still, as pointed out by the

investigators, there may be issues with underuse for people who have IDD. There is an absence of studies that examine the issue of disparity in a larger, more diverse sample of patients who have IDD as well as for those patients who have evidence of a diagnosis of HF or ASCVD.

Disparities in health care experienced by patients with IDD have been identified.⁸ Prescribing disparities may exist as a result of barriers to care, including access, communication, and reliance on other people for support. A recent study examining possible disparity in diabetes management for adult patients with IDD and diabetes used Medicaid claims data from 5 different states. The results showed that variability in 4 diabetes quality measures existed by state.²¹ In 2 states, patients with IDD and diabetes had higher rates than the non-IDD group of receiving all 4 interventions related to quality diabetes care, whereas in 2 other states, it was the non-IDD group that had higher rates of utilization. Non-IDD and IDD patients in the fifth state had equal utilization. The authors discussed potential reasons for the variability, one of which may be related to variation in Medicaid policies between states.

The overall objective of this study was to identify if disparities exist in the use of GBP for 2 common cardiac-related medical conditions—HF and ASCVD—for people who have IDD compared with those with the same conditions who do not have IDD. The majority of studies in the literature have determined that disparities in the use of health care exists for people who have IDD. However, there is evidence from the small single-center study previously described as well as the recent study of diabetes quality measures that utilization may vary based on where health care is accessed and provided. The present study utilizes a large health care administrative claims data set, which includes people covered by commercial insurance living throughout the United States. For the present study, it was hypothesized that commercially insured patients who have IDD will have the same or lower use of GBP for ASCVD and HF than people who do not have IDD. Health disparity is defined as population-specific differences in key health indicators, in this case use of GBP, between people with and without IDD, without inference to the cause of these differences.⁸ A secondary objective was to determine, within the sample of patients with IDD, whether differences in use of GBP exist by type of condition associated with IDD.

Methods

This is a retrospective analysis using the Clinformatics DataMart (OptumInsight, Eden Prairie, MN), an administrative health care claims database of commercially insured beneficiaries, from January 1 to December 31, 2014. The Clinformatics DataMart Database is a deidentified claims database that captures all outpatient, inpatient, emergency department, outpatient pharmacy, and office visit utilization for more than 80 million individuals. It should be noted that pharmacy claims in an administrative claims data set represent the action of the pharmacy dispensing a medication to a patient. By design, all enrollees in this database have both medical and pharmacy coverage during their enrollment period. The study was determined to be exempt by the university institutional review board. The investigators had full access to all data in the study and take responsibility for its integrity and the data analysis.

We selected all adults age 18 years and older who were enrolled in their insurance plan in the calendar year 2014. We subsequently identified patients in that calendar year who had IDD diagnosis in any position on the insurance claim using *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM) codes. These patients comprised the IDD sample. We further identified the type of IDD for each of the 4 groups (Down syndrome, cerebral palsy, autism spectrum disorder, and other). We also selected patients without evidence of an IDD diagnosis during the same calendar year as general population controls representing the non-IDD patient sample. For all IDD and non-IDD patients, we identified those who had at least 1 medical claim with a HF or ASCVD diagnosis at any point in the calendar year with a full calendar year of continuous enrollment. Conditional on the GBP measures and the cardiovascular diagnoses, we performed appropriate inclusion and exclusion criteria documented in eFigures 1 through 10 available online (also refer to the Online Appendix for exclusion criteria and diagnosis codes used for IDD, HF, and ASCVD; Appendix Tables 1 and 2). Not all patients with HF or ASCVD can take GBP because of the presence of contraindications. We applied previously described exclusion criteria based on contraindications for each of the HF and ASCVD analyses.^{13,14,22,23} Contraindications used for this study are documented in eFigures 1 through 10.

A number of references were used to establish the 5 GBP measures. These included medications for ASCVD/myocardial infarction (prescription platelet aggregation inhibitors, β -blockers, and statins) and HF (ACE inhibitors/ARBs, β -blockers). The GBP measures were based on national guidelines for the treatment of ASCVD and HF. Refer to the Online Appendix for details regarding GBP measure specifications. We calculated the proportion of patients who had pharmacy claims for β -blocker, ACE inhibitor/ARB, statin, or antiplatelet prescriptions stratified by either ASCVD or HF. The numerator was the number of patients who had a claim for at least 1 prescription for the appropriate GBP medication for ASCVD or HF during the observation period defined by the measure specification, whereas the denominator was all patients with the diagnosis of either ASCVD or HF applying exclusion criteria based on the GBP medication being assessed.^{13,14,22,23}

Our primary analysis examined the 2014 cohort of IDD and non-IDD patients. We calculated proportions for categorical variables (ie, sex, race, US Census Region, household income, and Elixhauser comorbidity index) and means and SDs for age (continuous variable) for characteristics for non-IDD and IDD patients stratified by ASCVD and HF groups.

Multivariable logistic regression analysis was conducted to determine the association of group assignment of having IDD or not (non-IDD group), controlling for patient demographics (age, gender, race, household income, and region of the United States where the patient lives) and comorbidity (Elixhauser comorbidity index). Five different models were run: 3 for ASCVD and 2 for HF. The results provided adjusted odds ratios and 95% CIs for each variable, with IDD group assignment being the primary variable of interest. All analyses were conducted using Statistical Analysis System (SAS Institute, Cary, NC).

Results

For the primary analysis, we examined characteristics of the sample in the 2014 data (Table 1). We identified 2190 IDD patients and 790 343 non-IDD patients with ASCVD. We also identified separately 1011 patients with IDD and 236 638 non-IDD patients with HF. The IDD patients were younger than the non-IDD patients. For ASCVD patients, there was a similar proportion of people who were women (IDD: 45.8%; non-IDD: 43.3%), whereas with HF patients, the proportion of women was lower for IDD patients (IDD: 46.6%; non-IDD: 50.8%). There were similar patterns in racial composition between IDD and non-IDD patients regardless of being diagnosed with ASCVD or HF. IDD patients had a higher burden of illness, with 68.8% of ASCVD patients with 5 or more comorbid conditions, compared with 47.2% for non-IDD patients. Conversely, for both IDD and non-IDD patients with HF, there was substantial burden of disease (IDD: 87.9%; non-IDD: 80.7%).

Tables 2 and 3 provide data on the proportion of patients who had pharmacy claims for GBP for ASCVD and HF and the associated adjusted odds ratio and 95% CIs, categorized by IDD or non-IDD patients. A significantly lower proportion of IDD patients who had ASCVD had pharmacy claims for statins (47.9% vs 58.7%; adjusted odds ratio of 0.73, with 95% CI = 0.67–0.8), β -blockers (35.8% vs 48.4%; adjusted odds ratio of 0.65 and 95% CI = 0.58–0.73), and antiplatelets (13.1% vs 18.9%; adjusted odds ratio of 0.64 and 95% CI = 0.56–0.73) compared with non-IDD patients. For IDD patients who had a diagnosis of HF, the proportion who had pharmacy claims for β -blockers (46.8% vs 59.8%; with adjusted odds ratio of 0.66 and 95% CI = 0.55–0.79) was significantly lower than that for patients in the non-IDD group. ACE inhibitor/ARB (50.3% vs 55.4%; adjusted odds ratio of 0.87, with 95% CI = 0.76–1.003) patients in the IDD group had lower but statistically insignificant difference in use compared with patients in the non-IDD group. Refer to Online Appendix eTable 3 for the results of the multivariable models. Variables consistently significant for GBP for ASCVD include gender (female being less likely to not use GBP), race (compared with whites, minority patients less likely to use GBP), region of the country where the patient lives (compared with the west, midwest and to some extent the northeast more likely and south less likely to use GBP), annual household income (compared with the highest income, all categories with lower income, except the unknown category, were less likely to use GBP), and comorbidity (compared with those with the highest comorbidity, those with lower comorbidity categories were less likely to use GBP).

For HF, similar patterns were observed for the independent variables, with the exception of ACE inhibitor/ARB, where IDD group and several regions of residence and comorbidity categories were insignificant.

We also performed an adjusted subanalysis of only IDD patients, stratifying patients by their type of IDD diagnosis, which included cerebral palsy, Down syndrome, other, and pervasive developmental disorders (autism spectrum disorders). Compared with the autism spectrum disorder, patients who had Down syndrome had the lowest likelihood of being prescribed a GBP for ASCVD or HF. Refer to eTable 4 in the Online Appendix for the results of the full multivariable logistic regression models. The adjusted odds ratios for patients with Down syndrome who had ASCVD was 0.26 with 95% CI from 0.13 to 0.51 for β -blockers, and

0.51 with 95% CI from 0.32 to 0.80 for statins. There was lower likelihood for use of prescription antiplatelet medication for patients who had Down syndrome, but the adjusted odds ratio (0.66 with 95% CI from 0.32 to 1.38) was not significantly different from that of the reference group (autism spectrum disorder). For HF, β -blocker use was lowest for patients with Down syndrome, with adjusted odds ratio of 0.34 and 95% CI from 0.14 to 0.82, and for use of ACE inhibitor/ARBs, with adjusted odds ratio of 0.33 and 95% CI from 0.16 to 0.66.

Patients in the cerebral palsy group (odds ratio of 0.53, 95% CI = 0.34–0.84) and the “other” group (odds ratio of 0.54, 95% CI = 0.35–0.84) had significantly lower likelihood of using β -blockers for ASCVD; all other odds ratios were not significantly different compared with the pervasive developmental disorders group (autism spectrum disorder).

Discussion

The primary finding of this study was that patients who have IDD were less likely than patients without IDD to have pharmacy claims for GBP for the treatment of ASCVD or HF in a commercially insured US sample. The absolute differences were as follows: 5.1% for pharmacy claims for ACE inhibitor/ARB therapy for HF, 5.8% for antiplatelet therapy for ASCVD, 10.8% for statins for ASCVD, 12.6% for β -blockers for ASCVD, and 13.0% for β -blockers for HF. Also, there are disparities in the use of the 5 GBP disease comparisons made within the IDD sample, where patients who have Down syndrome have lower rates of pharmacy claims compared with other categories of IDD. Disparities in the use of medications for heart diseases have been documented based on race as well as gender.^{24–28} The present study provides evidence for disparity in the use of GBP for people who have IDDs and either ASCVD or HF. A review of the literature found no reason to justify the disparity based on common comorbidities associated with IDD that may be contraindications to use of the GBP. The relative and absolute contraindications for medications used to treat these conditions are not found in a greater prevalence in people with IDD than the general population.

Using the Medical Expenditure Panel Survey (MEPS) data set, Levine et al¹³ also measured the use of GBP for coronary heart disease in the US population. They found prescribing rates of 31% (95% CI = 28–35) for salicylates and/or platelet aggregation inhibitors, 60% (95% CI = 56–63) for β -blockers, and 64% (95% CI = 61–67) for statins.¹³ The present study found that the non-IDD group was prescribed the GBP for β -blockers (48.4%) and statins (58.7%) at a lower rate than that reported by Levine et al. The antiplatelet data are much lower in the present study (18.9%), primarily because the definition of antiplatelet therapy was restricted to prescription only, missing aspirin use. In the present study, patients with IDD had significantly lower rates of being prescribed β -blockers (35.8%), statins (47.9%), and antiplatelets (13.1%) compared with the non-IDD group.

Another study using the MEPS data set analyzed data from 2002 to 2013.¹³ One set of quality measures assessed in that study was whether recommended guideline-based prescription therapy was prescribed or not for the treatment of HF. The weighted percentages and 95% CIs of people who had HF and GBP were 57% (50–63) for ACE

inhibitor/ARB (57%, 50–63) and 65% (58–72) for β -blockers. Our data in 2014 showed that ACE inhibitor/ARB (55.4%) and β -blocker therapy (59.8%) in the non-IDD group was similar to that found by Levine et al,¹³ whereas the IDD sample had lower use of ACE inhibitors/ARBs (50.3%) and β -blockers (46.8%).

The finding that patients who have Down syndrome had lower rates of use compared with the other 3 categories of patients with IDD for ASCVD or HF has not been reported elsewhere in the literature. Further work must be conducted to verify this disparity and, should it be confirmed, to determine the causes. When one thinks of contraindications to use of the medications examined in this study, there are no risk factors in patients who have Down syndrome that are more or less common than in other types of IDD.

Genetics, social circumstances, environmental conditions, ability to engage in health promotion, and access to medical care all contribute to disparity in health outcomes of people with IDD.⁸ Research indicates that most individuals with developmental disabilities do not receive the services that their health conditions require.^{29–32} Research on access to and quality of physical, mental, and dental health care demonstrates that people who have IDD face more barriers to health care than the general population. Prescriber attitudes toward working with patients who have IDD, insurance-related access to medications, and patient personal and caregiver attributes associated with medication taking behavior may also have a role in whether a person with IDD receives GBP.³³ Prescribers often have little training in caring for people who have IDD, have inadequate knowledge of community support services and resources, and often do not have enough time for examination/consultation when working with people who have IDD.³³ Individuals with intellectual disabilities often lack the ability to recognize health problems, or they may be unable to communicate their distress, which makes recognition, diagnosis, and treatment challenging.^{32,34–37} Poor communication skills may also result in maladaptive behaviors that pose additional challenges for health professionals and caregivers.

Disparities in receipt of therapy for cardiovascular conditions have been well documented based on age, gender, and race.^{38–41} Female gender, minority status, and to some extent, younger age are associated with lower likelihood of receiving medication therapy for conditions such as cardiovascular disease, diabetes, asthma, HF, and HIV infections. A recent study by Levine et al⁴² found that older adults who have mild cognitive impairment and who experienced a myocardial infarction were less likely to receive cardiac catheterization, coronary revascularization, and cardiac rehabilitation. Likewise, people with severe mental illness also receive lower rates of invasive coronary interventions after a cardiac event.⁴³

A limitation of this study is the lack of clinical data and knowledge of date of onset of either HF or ASCVD diagnosis. The administrative data set used for this study is composed of claims associated with health care utilization, without clinical data. For HF, data such as ejection fraction, serum creatinine, and serum potassium levels, and for ASCVD, serum cholesterol levels and liver function tests, would be useful to further refine the inclusion/exclusion criteria used for the present study. A related limitation is that the use of ICD-9 codes to identify diagnoses is not always accurate, because misclassification of diagnosis

based on an administrative claim may exist.^{44–47} It should be noted that pharmacy claims in an administrative claims data set represent the action of the pharmacy dispensing a medication to a patient. By design, all enrollees in this database have both medical and pharmacy coverage during their enrollment period. Although misclassification may exist, there is no evidence that there may be variation in misclassification of chronic conditions in people who have IDD and those who do not. In a study design such as that used for the present study, there may then be equal chance for accurate and inaccurate classification of ASCVD and HF in both groups.

A pharmacy claim for a medication may not always reflect the actual use of the medication by the patient. A medication claim is formed by adjudication of a prescription at a pharmacy when the medication is dispensed. What is not clear is the actual prescribing of medications by clinicians or whether the patient actually took the medication. When using administrative pharmacy claims, it is assumed that the dispensed medication is taken by the patient. Also, it is not known how many times a prescription is written by a prescriber but never picked up by the patient, in which case, the medication claim would be reversed by the pharmacy. Another potential problem with using pharmacy claims data is that, over time, patients become nonadherent to the medication prescribed, which may be interpreted as not being prescribed the medication. Results obtained from studies using administrative claims data do provide valuable information, if the limitations are understood. For this study, the phrase “use of GBP” represents the assumed act of a medication being prescribed for a patient and that the patient obtained the medication from a pharmacy. In addition, we did not address whether target doses of agents were reached or whether agents that were prescribed were appropriate based on comorbidities present. As for ASCVD, we do not know if patients were taking aspirin either as a lone antiplatelet therapy or as part of a dual antiplatelet therapy. Outcomes were not assessed in the present study, such as hospitalization for related medical conditions. Now that disparities in the use of GBP for patients with IDD have been identified, further research should be undertaken to determine the outcomes associated with underutilization as well as to identify patient, system, and social factors that may contribute. Finally, the data set used for this study is composed of patients who have private insurance. This may represent a smaller portion of all adults who have IDD in the United States because most receive Medicaid or are dual eligible for Medicare/Medicaid.⁴⁸ Future research should focus on patients with IDD who utilize Medicaid to not only determine whether disparities exist in use in this larger sample, but also to compare use in adult patients with IDD who have private versus public insurance.

Conclusion and Relevance

Disparities exist in the use of GBP for patients with IDD with ASCVD and HF conditions. Clinicians providing care for patients who have IDD, and in particular those who have Down syndrome, need to pay close attention to their symptoms, ability to manage medication therapy, and whether barriers to using medications appropriately exist. Working with the patient and the people who provide support, such as family and employed support persons, should lead to improved use of medication and related outcomes. Further work should be conducted to determine the causes of these disparities as well as to study the outcomes associated with lack of appropriate drug therapy.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Comparison of IDD and Non-IDD Patients From the 2014 Enrollment Year for Those Diagnosed With Atherosclerotic Cardiovascular Disease or Heart Failure.

Table 1.

Attribute	Atherosclerotic Cardiovascular Disease		Heart Failure	
	IDD, n = 2190	Non-IDD, n = 790 343	IDD, n = 1011	Non-IDD, n = 236 638
	Count (%)	Count (%)	Count (%)	Count (%)
Age, mean (SD)	63.9 (15.0)	71.6 (11.3)	64.7 (16.1)	74.2 (11.7)
Gender				
Female	1003 (45.8)	342 565 (43.34)	471 (46.59)	120 239 (50.81)
Race				
Asian	48 (2.19)	19 738 (2.5)	15 (1.48)	4591 (1.94)
Black	239 (10.91)	66 397 (8.4)	122 (12.07)	24 704 (10.44)
Hispanic	135 (6.16)	66 369 (8.4)	63 (6.23)	19 770 (8.35)
White	1254 (57.26)	480 828 (60.84)	583 (57.67)	140 301 (59.29)
Unknown/missing	514 (23.47)	157 011 (19.87)	228 (22.55)	47 272 (19.98)
Region				
Midwest	618 (28.22)	184 625 (23.36)	278 (27.5)	53 763 (22.72)
Northeast	388 (17.72)	117 676 (14.89)	199 (19.68)	35 565 (15.03)
South	712 (32.51)	295 931 (37.44)	338 (33.43)	83 503 (35.29)
West	467 (21.32)	188 324 (23.83)	196 (19.39)	62 505 (26.41)
Unknown	5 (0.23)	3787 (0.48)	—	1302 (0.55)
Annual household income				
<\$40 000	545 (25.61)	198 588 (26.35)	252 (25.77)	70 018 (30.89)
\$40 000-\$49 000	123 (5.78)	55 739 (7.4)	57 (5.83)	18 035 (7.96)
\$50 000-\$59 000	118 (5.55)	60 639 (8.05)	48 (4.91)	18 454 (8.14)
\$60 000-\$74 000	144 (6.77)	78 852 (10.46)	65 (6.65)	22 164 (9.78)
\$75 000-\$99 000	173 (8.13)	101 298 (13.44)	79 (8.08)	25 636 (11.31)
\$100 000+	205 (9.63)	140 851 (18.69)	88 (9)	30 618 (13.51)
Unknown	820 (38.53)	117 586 (15.6)	389 (39.78)	41 708 (18.4)
Missing	62	36 790	33	10 005
Elixhauser Comorbidity Index				

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Attribute	Atherosclerotic Cardiovascular Disease				Heart Failure	
	IDD, n = 2190		Non-IDD, n = 790 343		IDD, n = 1011	Non-IDD, n = 236 638
	Count (%)	Count (%)	Count (%)	Count (%)	Count (%)	Count (%)
0 to 4	684 (31.23)	417 400 (52.81)	122 (12.07)	45 670 (19.3)		
5 to 9	1106 (50.5)	307 879 (38.96)	541 (53.51)	135 981 (57.46)		
10 or more	400 (18.26)	65 064 (8.23)	348 (34.42)	54 987 (23.24)		

Abbreviations: ACE inhibitor/ARB, angiotensin-converting enzyme inhibitor/angiotensin receptor blocker; IDD, intellectual and developmental disabilities.

Table 2.

Prescribing of Evidence-Based Pharmacotherapy for Patients Who Have ASCVD: Comparison of Patients Who Have IDD Versus Those Without in the Optum Clinformatics Database (2014).^a

Atherosclerotic Cardiovascular Disease Measures	2014, IDD Adult, n = 2190, Percentage (95% CI); N/D	2014, Non-IDD Adult, n = 790 343, Percentage (95% CI); N/D	P Value	Adjusted Odds Ratio (95% CI)
Proportion on β -blocker	35.8 (33.2, 38.4); 473/1322	48.4 (48.3, 48.5); 296 124/611 823	<0.001	0.65 (0.58–0.73)
Proportion on statin	47.9 (45.7, 50); (1006/2102)	58.7 (58.7, 58.9); 457 093/778 394	<0.001	0.73 (0.67–0.80)
Proportion on prescription antiplatelet	13.1 (11.7, 14.5); 286/2190	18.9 (18.8, 19.0); 149 642/790 343	<0.001	0.64 (0.56–0.73)

Abbreviations: ASCVD, atherosclerotic cardiovascular disease; D, number of patients meeting the denominator criteria; IDDs, intellectual and developmental disabilities; N, number of patients receiving guideline-based therapy.

^aDenominator numbers (D) reflect those patients who met inclusion and exclusion criteria for each of the measures.

Table 3.

Prescribing of Evidence-Based Pharmacotherapy for Patients Who Have Heart Failure: Comparison of Patients Who Have IDD Versus Those Without in the Optum Clinformatics Database (2014).^a

Heart Failure Measures	2014, IDD Adult, n = 1011, Percentage (95% CI); N/D	2014, Non-IDD Adult, n = 236 638, Percentage (95% CI); N/D	P Value	Adjusted Odds Ratio (95% CI)
Proportion on β -blocker	46.8 (42.4, 51.3); 237/506	59.8 (59.6, 60.1); 89 331/149 374	<0.001	0.66 (0.55–0.79)
Proportion on ACE inhibitor/ARB	50.3 (46.9, 53.7); 426/847	55.4 (55.2, 55.6); 121 155/218 609	0.003	0.87 (0.76–1.003)

Abbreviations: ACE, angiotensin-converting enzyme; ARB, angiotensin-receptor blocker; D, number of patients meeting the denominator criteria; IDDs, intellectual and developmental disabilities; N, number of patients receiving guideline-based therapy.

^aDenominator numbers (D) reflect those patients who met inclusion and exclusion criteria for each of the measures.