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Who diagnosed and prescribed what? Using provider details to inform observational research

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Abstract

Purpose.—To describe how often patients with depression initiating antidepressants receive their depression diagnosis and prescriptions from the same provider and, when simultaneously initiating benzodiazepines, how often both prescriptions come from the same provider.

Methods.—Using US healthcare claims data, we created a cohort of adults (18-64 years) with a depression diagnosis who initiated antidepressants. We examined concordance by provider specialty and provider identifier between a) the first antidepressant prescription fill and most proximal depression diagnosis, and b) the initial antidepressant and benzodiazepine prescription fills among simultaneous benzodiazepine and antidepressant initiators.

Results.—Among 245,166 antidepressant initiators with a recent depression diagnosis (female=67%; median age=39), the specialty of the provider assigning the depression diagnosis matched the antidepressant prescriber's specialty in 94% of cases with known provider details (provider identifier concordance=93%). Concordance was higher for adults diagnosed by a general practitioner (98%) or psychiatrist (92%) than for those diagnosed by a psychologist (74%). In simultaneous new users of antidepressants and benzodiazepines (n=19,371), both prescriptions were issued by the same provider specialty and provider identifier 94% and 93% of the time, respectively.

Conclusions.—The vast majority of patients who received antidepressant prescriptions and depression diagnoses appear to have received both diagnosis and antidepressants from the same provider, suggesting that when antidepressants are issued around the time a patient is diagnosed with depression, the antidepressant was likely prescribed for depression. In addition, the great majority of patients who simultaneously initiate benzodiazepines appear to do so under the direction of one provider.

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Keywords

claims database; provider concordance; concurrent prescribing; depression; prescriber; observational research

INTRODUCTION

In pharmacoepidemiologic research appropriate database selection is important,[1] provider-level detail on patient diagnoses and prescriptions is often unavailable, even though such information is useful in defining circumstances that aid in confounding control and thereby causal inference.

We illustrate the utility of provider level detail by drawing on our 2017 study where a tenth of adults with depression initiating antidepressant therapy contemporaneously initiated benzodiazepine therapy.[2] While benzodiazepines have a limited role in treating depression,[3] contemporaneous benzodiazepine and antidepressant initiation in adults with depression potentially offers narrow short-term benefits over antidepressant monotherapy.[4] In our study, we did *not* have information on prescriber, which left unresolved questions about whether the provider who diagnosed depression was also the antidepressant prescriber, and by extension whether patients initiated an antidepressant for depression (or for another indication, such as anxiety, insomnia, pain).[5] Further, for patients simultaneously initiating antidepressants and benzodiazepines, we were unable to determine whether simultaneous initiation was purposefully prescribed by one physician, or, instead, whether the benzodiazepine was prescribed by a different provider (who may be unaware of the antidepressant prescription). Knowing the latter, for example, would allow us to examine whether untoward outcomes differ depending on whether simultaneous initiation is attributable to one or to more than one prescriber. We use provider details on patient diagnoses and dispensed prescriptions to estimate how often a) adults were diagnosed with depression and prescribed an antidepressant by the same provider (e.g., overall and by specialty, such as primary care physician vs. psychiatrist), and b) simultaneous new users of antidepressants and benzodiazepines received prescriptions for both drugs by the same provider.

METHODS

We used IMS Health's LifeLink Health Plan Claims Database (2000-2010), a US commercial claims database covering privately insured individuals with information on the provider of diagnoses and dispensed prescriptions.[2] We included adults (18-64 years) newly initiating an antidepressant from 2001 to 2010. Adults were required to have a depression diagnosis at least 30 days prior to, or on the day of, antidepressant initiation and continuous insurance enrollment with no antidepressant or benzodiazepine use in the year before antidepressant initiation. Approximately a fourth of antidepressant initiators had a recent depression diagnosis, similar to prior research in this database,[6] and consistent with antidepressants being prescribed for many,[5] often unrecorded indications.[7] Of 280,132 antidepressant initiators with a recent depression diagnosis, we excluded adults with baseline diagnoses of substance abuse, bipolar disorder, personality disorder, or

schizophrenia (excluded n=34,531), and adults filling 4+ antidepressant prescriptions at initiation (excluded n=435). Simultaneous new benzodiazepine use was defined as a benzodiazepine dispensed on the same date as antidepressant initiation.

Provider variables included provider specialty from patient-level claims and a provider identification number, defined as the provider who directed services within a cluster.[8] Selected services were grouped into cluster providers (i.e. provider directing set of services) and patients missing specialty provider information may include situations when no cluster provider was determined.[8] We selected provider information from three distinct points of patient contact with the healthcare system: a)diagnosis of depression most proximal to antidepressant initiation, b)initial antidepressant prescription, and c)initial benzodiazepine prescription among adults with simultaneous new use.

We examined a)concordance of provider specialty and provider identifier between the first antidepressant prescription fill and the depression diagnosis closest (and prior) to antidepressant initiation, b)how concordance varied by the number of days between depression diagnosis and first antidepressant prescription, and c) among simultaneous new users, provider concordance between provider specialty and provider identifier on the first antidepressant and benzodiazepine prescriptions. We examined concordance by specific provider specialty for more common provider types. Descriptive analyses were restricted to adults with non-missing provider information.

RESULTS

Depression diagnosis vs. antidepressant prescription

Among 245,166 adults with a depression diagnosis who initiated an antidepressant, 86% (n=209,808) had a known provider specialty on the depression diagnosis and antidepressant prescription. The provider specialty of the depression diagnosis matched the provider specialty of the antidepressant prescriber in 94% of cases. Patients diagnosed with depression by a general practitioner received their antidepressant prescription from a general practitioner 98% of the time (psychiatrist=92%;Table 1). For the small proportion of adults with a depression diagnosis from a social worker or psychologist (3% and 5%, respectively), we observed lower concordance: social work=67%, psychologists=74%. Ninety-three percent had provider identifier concordance between the depression diagnosis and antidepressant prescription(Table 1).

When the depression diagnosis was the same day as antidepressant initiation (58% of initiators), the antidepressant prescriber was more likely to have diagnosed the depression (provider identifier concordance=97%). For cases with 1-7 days between depression diagnosis and antidepressant prescription (25% of initiators), 89% had concordant provider identifiers; 86% concordance in patients with >7-30 days between their diagnosis and prescription.

Antidepressant vs. benzodiazepine prescriptions

Eight-percent(n=19,371) of antidepressant initiators simultaneously initiated a benzodiazepine. In simultaneous new users with known provider information, 94% had the

same provider specialty on the antidepressant and benzodiazepine prescription and 93% the same provider identifier(Table 1). Concordance varied somewhat by provider specialty. For example, 97% of adults with an antidepressant prescription from a general practitioner also had a benzodiazepine prescription from a general practitioner vs. 88% concordance in patients with an antidepressant from a psychiatrist.

DISCUSSION

Provider details on prescriptions and diagnoses indicate that the vast majority of the time, providers diagnosing patients with depression also prescribed the antidepressant. We required a depression diagnosis at least 30 days prior to antidepressant initiation, and, as expected, concordance was modestly higher, when the diagnosis and prescription fill were on the same day. Among simultaneous new antidepressants and benzodiazepines users, prescriber-level details indicated that, for the vast majority, the same provider prescribed the antidepressant and benzodiazepine. For the 7% of simultaneous new users with non-concordant provider identifiers, it is possible simultaneous new use was unintended. Future studies could examine whether dissonance in provider status leads to higher rates of adverse outcomes

Research Implications

In comparative effectiveness research, identifying a more restricted study cohort can reduce confounding by indication and keep research focused on a clinically relevant sample.[9,10] Provider details for patient diagnoses and prescriptions allow researchers to hone in on a target population by increasing assurance about the medication's indication (here, depression) without requiring additional assumptions (e.g., same-day clinical diagnosis and prescription fill) that could exclude many concordant cases. Based on our findings, within a small margin of error, assuming the provider diagnosing depression was the prescriber of antidepressant seems warranted. However, this applies to cases with known provider details and the assumption may not hold for other medications with multiple on and off-label indications (e.g., beta-blockers for hypertension, heart failure, migraine, etc.), where concordance between prescribing and diagnosing providers may be less compelling. Results on provider concordance could also vary across data sources as patient-level provider information may vary in collection method and definition by database and individual insurance plan. Provider-level details allow for sensitivity analyses in cohort selection, helping researchers better understand and quantify potential bias, and for using physician preference as an instrument[11,12] and as a potential confounder. Prescriber details also allow researchers to examine concurrent medication use and related outcomes in patients with prescriptions from multiple providers (here, antidepressant and benzodiazepine co-initiation; elsewhere opioid and benzodiazepine prescribing from multiple vs single provider in healthcare claims[13,14]). Lastly, provider details can inform manufacturers on post-marketing drug utilization and prescribing patterns, including examination of heterogeneity across provider specialties.

Considerations

Our data do not distinguish between provider facility(e.g.,multi-group practice) and individual providers. Given growth in integrated care networks, it is likely our dataset ending in 2010 provides a better proxy for individual provider than more recent data. Actual provider concordance may vary over time, and we do not know how often patient care was coordinated between providers, including whether providers had the ability (or time) to view each other's diagnoses and prescriptions. We are uncertain whether an individual provider has consistent identifiers across facilities, in which case a concordant provider could appear non-concordant. We can only evaluate provider concordance in cases with a recorded depression diagnosis. Given low sensitivity of depression diagnoses in claims data,[15] there are likely many adults initiating an antidepressant with depression but no recorded diagnosis.

Some provider specialty variables are non-specific(i.e. hospital, urgent care); it is unclear how physicians with multiple specialties are classified. Lower provider concordance among psychologists and social workers is assumed to be a consequence of prescribing restrictions; we do not know whether prescriptions from provider specialties with limited prescribing privileges actually prescribed the medication or coordinated care with another prescribing provider. Results are limited to patients with non-missing provider information. Even with provider details, when providers document multiple relevant diagnoses (ex. depression and anxiety), we cannot determine if the provider prescribed the medication to treat one indication or both concurrently.

Conclusions

The vast majority of patients who received depression diagnoses and antidepressant prescriptions received both from the same provider. The great majority of patients simultaneously initiating antidepressants and benzodiazepines appear to do so under the direction of single provider. For these diagnoses and medications, when prescriber details are unavailable, substituting diagnosing provider for the assumed prescriber may be warranted within a small margin of error.

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Table 1.

Provider concordance between a) depression diagnosis and antidepressant prescription and b) antidepressant and benzodiazepine prescriptions in adults with simultaneous new use

	Depression diagnosis vs. antidepressant prescription[a] (n=245,166)		Antidepressant vs. benzodiazepine prescription (n=19,371)	
	No. (%)	% concordant[c] (95% CI)	No. (%)	% concordant[c] (95% CI)
Provider identifier[b] concordance				
Concordant provider details	199,855 (82)	93% (93-93)	13,375 (69)	93% (93-94)
Differing provider details	15,187 (6)		984 (5)	
Missing on either	30,124 (12)		5,012 (26)	
Provider specialty concordance				
Concordant provider details	197,514 (81)	94% (94-94)	13,116 (68)	94% (94-94)
Differing provider details	12,294 (5)		822 (4)	
Missing on either	35,358 (14)[c]		5,433 (28)[c]	
Concordance by most common provider specialties[d]				
General, family practice	90,601 (43)	98% (98-98)	6,155 (44)	97% (96-97)
Internal medicine	34,770 (17)	97% (97-97)	2,665 (19)	95% (95-96)
Psychiatry	24,374 (12)	92% (92-93)	1,719 (12)	88% (87-90)
Psychology[e]	9,765 (5)	74% (73-75)	330 (2)	83% (78-87)
Obstetrics and Gynecology	6,956 (3)	97% (96-97)	226 (2)	92% (87-95)
Social work[e]	6,483 (3)	67% (66-69)	205 (1)	88% (83-92)
Nurse practitioner	3,841 (2)	97% (96-97)	240 (2)	95% (92-97)
Cardiology	3,293 (2)	96% (95-96)	260 (2)	95% (92-97)

[a] Depression diagnosis was required to be within the 30 days before antidepressant initiation

[b] In certain situations, the provider identifier may represent a multi-provider facility rather than an individual

[c] Percent concordant calculated among patients with non-missing provider details; Missing depression diagnosis provider specialty: n=12,122 (5%), missing antidepressant prescription provider specialty: n=30,329 (12%); In simultaneous new users, missing antidepressant prescription provider: n=2,243 (12%), missing benzodiazepine prescription provider: n=4,575 (24%)

[d] Counts/percentages exclude patients with missing provide specialty; Most common non-specific provider specialties include: hospital=0.8%; other facility=0.7%; mental health/substance abuse facility=0.3%

[e] Provider specialists with noteworthy prescribing restrictions; we cannot know whether or when these providers worked with a prescribing provider to coordinate care