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Venlafaxine prescription claims among insured women of reproductive age and pregnant women, 2011–2016

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Abstract

Background: Some studies have reported associations between prenatal use of venlafaxine, a serotonin-norepinephrine reuptake inhibitor used for depressive and anxiety disorders, and some birth defects. We described the prevalence of venlafaxine prescription claims among privately insured women of reproductive age and pregnant women.

Methods: Venlafaxine prescription claims were examined using the IBM MarketScan Commercial Databases. We included women of reproductive age (15–44 years) who had ≤45 days of lapsed enrollment during the calendar year of interest (2011–2016) in a non-capitated healthcare plan sponsored by a large, self-insured employer with prescription drug coverage and no mental health service carve-out. Annual cohorts of pregnant women were identified among eligible women of reproductive age via pregnancy diagnosis and procedure codes. Venlafaxine prescriptions were identified via National Drug Codes in outpatient pharmacy claims and we estimated the annual proportion of women with venlafaxine claims by pregnancy trimester (pregnant women only), age, and Census division.

Results: Each year during 2011–2016, approximately 1.2% of eligible reproductive-aged and 0.3% of eligible pregnant women filled a venlafaxine prescription. Among pregnant women, the proportion with venlafaxine claims was highest during the first trimester and decreased during the second and third trimesters. Small temporal increases in venlafaxine claims were observed for reproductive-aged and pregnant women, with the largest among women aged 15–19 years.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest relevant to this article.

Conclusions: Venlafaxine prescription claims were low among women of reproductive age and pregnant women during 2011–2016, with some increasing use over time among women aged 15–19 years.

Keywords

antidepressants; pregnant women; venlafaxine; women's health

1 | INTRODUCTION

Venlafaxine, a serotonin-norepinephrine reuptake inhibitor (SNRI) antidepressant, is a first-line agent for treating depressive and anxiety disorders (XR EFFEXOR, 2017), conditions which disproportionately impact women (World Health Organization, 2017). Observational research studies using data from the National Birth Defects Prevention Study (NBDPS) suggest that prenatal use of venlafaxine may be associated with several birth defects (Anderson, Lind, Simeone, et al., 2020; Polen, Rasmussen, Riehle-Colarusso, et al, 2013). In contrast, a study using data from the Quebec Pregnancy Cohort only reported an association with respiratory defects, a heterogeneous outcome group that was not included in the NBDPS research (Berard, Zhao, & Sheehy, 2017). There is also some evidence of an association with preterm birth (Lennestal & Kallen, 2007). However, estimates of SNRI use in pregnancy are limited (Ailes, Simeone, Dawson, et al., 2016).

2 | METHODS

Using the IBM MarketScan Commercial Databases, we examined venlafaxine claims among women of reproductive age (15–44 years) who were continuously enrolled (≤45 days of lapsed enrollment) during the calendar year of interest (2011–2016) in a non-capitated healthcare plan sponsored by a Large, self-insured employer with prescription drug coverage and no mental health and substance abuse service carve-out.

Annual cohorts of pregnant women were identified among the eligible women of reproductive age via diagnosis and procedure codes indicating either the end of pregnancy, with gestational age assigned based on the International Statistical Classification of Diseases and Related Health Problems, 9th revision (ICD-9) algorithm by Ailes et al. (2016), or gestational week identified by ICD-10 codes (Z3A.XX). One pregnancy per woman per year was included, but women could have multiple pregnancies in different calendar years. Venlafaxine prescriptions were identified via National Drug Codes in outpatient pharmacy claims. For each calendar year, we calculated the proportion of women of reproductive age with venlafaxine prescription claims at any time and, for pregnant women, the part of the pregnancy that occurred dining the calendar year (see Figure 1). We also examined the proportion of women who filled prescriptions by pregnancy trimester (pregnant women only), age, and U.S. Census division.

3 | RESULTS

This analysis included more than 270,000 pregnant women (range: 271,153–292,173) and more than 2.9 million (range: 2,912,975–3,330,002) women of reproductive age each year

during 2011–2016 (Table 1). Approximately 1.2% of eligible reproductive-aged and 0.3% of eligible pregnant women filled a venlafaxine prescription in a year. Among pregnant women, the proportion with venlafaxine prescription claims was highest during the first trimester (range 0.24–0.31%) and decreased during the second (0.12–0.14%) and third trimesters (0.11–0.13%). Some small increases during 2011–2016 in venlafaxine prescription claims were observed for reproductive-aged and pregnant women, with the largest relative increases among women aged 15–19 years (Table 1). Among all women of reproductive age, venlafaxine prescriptions increased with age; among pregnant women, the pattern by age was not as consistent. In both cohorts, venlafaxine claims varied by U.S. Census division and was highest in the East South Central and West North Central divisions.

4 | DISCUSSION

Outpatient venlafaxine prescription claims were infrequent among women of reproductive age (1.2%) and pregnant women (0.3%) during 2011–2016, with some increasing use over time, particularly among women aged 15–19 years. There were no consistent patterns over time in outpatient pharmacy claims of venlafaxine by U.S. Census division, in either cohort. Many pregnant women discontinued venlafaxine use after the first trimester, as in a previous study (Ailes et al., 2016), although exposure would still have occurred in the critical period for birth defect risk.

A major limitation is that venlafaxine exposure was based on outpatient pharmacy claims, which may underestimate or overestimate actual use, and lacks clinical context, such as indication for use. Because of the ICD-10 transition, pregnancies ending pre- and post-September 2015 were identified with different algorithms. We could not validate pregnancy status and may have misclassified gestational length or prescription timing, particularly for pregnancies in 2015 and 2016; our novel ICD-10 pregnancy algorithm indicated a much lower frequency of preterm infants and a higher frequency of post-term infants than the previously established ICD-9-based pregnancy algorithm for previous years. Data were from a convenience sample of women with employer-sponsored insurance and may not be generalizable.

This analysis provides updated estimates of the frequencies of venlafaxine prescriptions among a nationwide convenience sample of reproductive-aged and pregnant women with employer-sponsored insurance.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from IBM MarketScan Research Databases. Restrictions apply to the availability of these data, which were used under license for this study. Data are available at URL: https://www.ibm.com/products/marketscan-research-databases with the permission of IBM.

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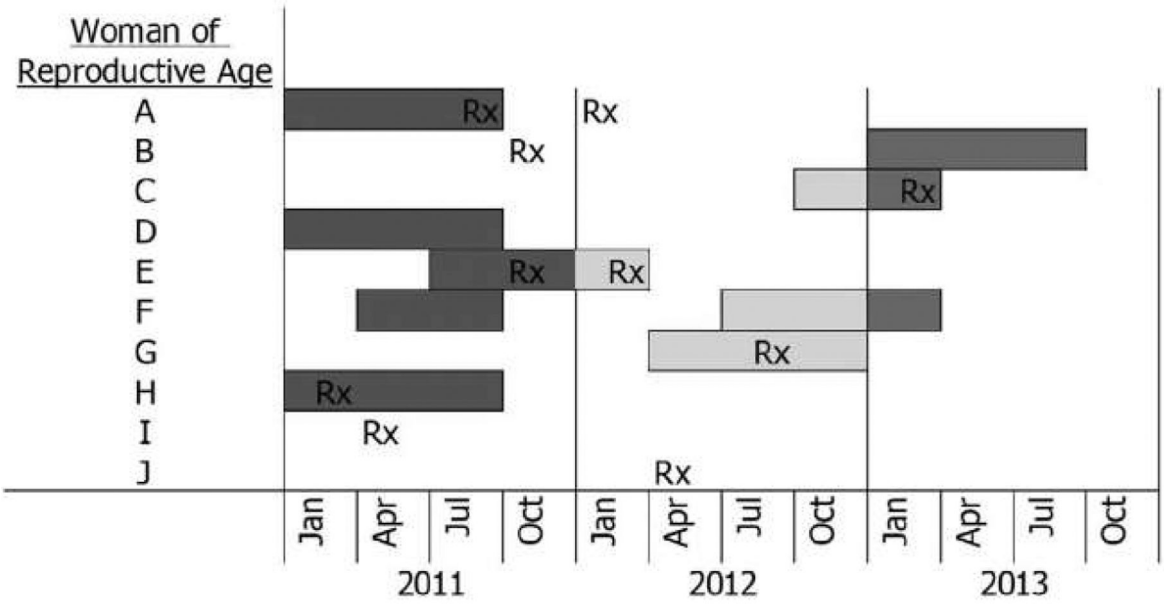

Proportion of women of reproductive age who filled a prescription for venlafaxine from an outpatient pharmacy in 2012

Total with Rx in 2012	4
Total number of women	10
	40%

Proportion of pregnant women who filled a prescription for venlafaxine from an outpatient pharmacy in 2012

Total with Rx in 2012	2
Total with any pregnancy time (i.e. shaded bar) in 2012	4
	50%

FIGURE 1.

Example calculations for the proportion of women of reproductive age and the subset of pregnant women with outpatient pharmacy prescription claims for venlafaxine during a given year. Shaded bars represent 30 days prior to the estimated date of pregnancy conception through delivery, with shading color corresponding to calendar year of exposure. “RX” indicates timepoints at which a venlafaxine prescription was filled

TABLE 1

Percentage of pregnant and all women aged 15–44 years who filled a prescription for venlafaxine from an outpatient pharmacy by year, 2011–2016, IBM MarketScan Commercial Databases

	Pregnant women[a]						**All women 15–44 years of age**[a]					
Percentage of eligible women with venlafaxine prescription claims (%)	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Overall[b]	0.30	0.28	0.30	0.31	0.31	0.33	1.17	1.13	1.21	1.21	1.24	1.21
First trimester of pregnancy[c]	0.24	0.27	0.28	0.28	0.28	0.31	N/A					
Second trimester of pregnancy	0.13	0.12	0.14	0.14	0.14	0.14						
Third trimester of pregnancy	0.13	0.11	0.12	0.13	0.13	0.13						
Age group (years)[d]												
15–19	0.19	0.27	0.25	0.27	0.23	0.40	0.29	0.29	0.35	0.41	0.53	0.55
20–24	0.25	0.24	0.26	0.29	0.34	0.38	0.71	0.73	0.82	0.86	0.95	1.05
25–29	0.25	0.19	0.20	0.25	0.26	0.32	0.94	0.92	0.94	0.95	0.97	0.99
30–34	0.33	0.28	0.28	0.28	0.29	0.28	1.27	1.23	1.21	1.20	1.21	1.20
35–39	0.31	0.39	0.41	0.37	0.37	0.34	1.54	1.56	1.58	1.55	1.53	1.51
40–44	0.45	0.50	0.50	0.58	0.40	0.52	1.89	1.92	2.03	2.00	1.94	1.89
U.S. Census division												
Pacific	0.22	0.21	0.24	0.20	0.17	0.23	0.95	0.90	0.90	0.85	0.83	0.83
West South Central	0.26	0.22	0.25	0.24	0.18	0.25	0.97	0.99	1.12	1.06	1.10	1.08
East North Central	0.29	0.33	0.34	0.32	0.35	0.39	1.29	1.24	1.30	1.33	1.42	1.43
Mountain	0.29	0.26	0.22	0.33	0.39	0.33	1.13	1.11	1.15	1.14	1.18	1.15
South Atlantic	0.30	0.26	0.30	0.28	0.29	0.33	1.19	1.14	1.21	1.20	1.17	1.12
New England	0.31	0.30	0.35	0.37	0.32	0.29	1.11	1.08	1.12	1.07	1.13	1.09
West North Central	0.32	0.39	0.32	0.40	0.43	0.43	1.40	1.42	1.56	1.58	1.66	1.64
Middle Atlantic	0.32	0.35	0.32	0.34	0.34	0.33	1.08	1.01	1.07	1.11	1.12	1.06
East South Central	0.35	0.29	0.35	0.42	0.40	0.44	1.44	1.44	1.55	1.61	1.67	1.65
Eligible women (*n*)	271,153	285,460	292,173	288,312	290,887	284,343	2,912,975	3,073,746	3,302,430	3,330,002	3,073,731	3,027,645

[a]We included privately-insured women, 15–44 years of age, continuously-enrolled (<45 days of lapsed enrollment) during the calendar year of interest in a non-capitated healthcare plan sponsored by a large, self-insured employer, with prescription drug coverage and no mental health and substance abuse service carve-out.

[b] Venlafaxine use for pregnant women was defined as any outpatient prescription claim for venlafaxine filled from 30 days prior to estimated date of conception through the date of delivery during the calendar year of study. Venlafaxine use for women 15–44 years of age was defined as outpatient prescription claims for venlafaxine during the calendar year of study.

[c] The percentages by trimester may sum to more than the overall percentage of women who filled a venlafaxine prescription during pregnancy because women might have filled a prescription in multiple trimesters. The first trimester of pregnancy includes the 30 days prior to the estimated date of conception.

[d] Age defined as age as of July 1st of the study year.