Analysis of Fluvoxamine Usage Amid COVID-19 Among Medicaid Patients

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Abstract

Background: Coronavirus took the lives of many around the world, and there have been many efforts to understand the mechanism of this disease. Fluvoxamine is a selective serotonin reuptake inhibitor (SSRI) but has many other mechanisms of action. Some researchers believe it is responsible for therapeutic efficacy for COVID-19. The rationale for examining fluvoxamine stems from the surge of prescription rates, from which we can infer that this drug is efficacious for COVID-19. The primary objective of this study is to review changes in the usage of fluvoxamine over time.

Methods: We searched the Medicaid State Drug Utilization Database and United States (U.S.) Census Bureau database. Quantified data was represented by drug use by state.

Results: Examination of Medicaid claims identified a rise in use of anti-inflammatory selective serotonin reuptake inhibitors during COVID-19. States like New York displayed greater fluvoxamine prescriptions due to deduced factors such as higher population density and being a high migrant destination.

Conclusion: From 2019 to 2021, during the height of the COVID pandemic, the use of fluvoxamine had an upwards trend among all 50 states and the District of Columbia. We sought to analyze fluvoxamine usage to discover a possible treatment option to provide infected patients with an outlet of support to alleviate symptoms of future diseases like COVID-19.

Introduction

The severe acute respiratory syndrome coronavirus 2 (SARS-COV-2), also known as COVID-19, has had a worldwide impact. In March 2020, the United States (U.S.) declared a national health emergency for COVID-19 (1). According to the Centers for Disease Control and Prevention (CDC), as of May 26, 2022, the total number of COVID-19 cases since 2020 is 83.4 million. Similarly, the total number of deaths due to COVID-19, as of May 26, 2022, has reached 1 million (2).

Initially, there were no available treatment options for COVID-19. Researchers experimented with many drugs and their antiviral properties. Monoclonal antibodies seemed to stop working as new COVID-19 variants emerged (3). Researchers discovered SSRIs increased chances of survival for patients with COVID-19 (4). Some SSRIs, such as paroxetine, had minimal success of 8% effectiveness in treatment of COVID-19 (5). The usage of fluvoxamine was 26% more effective than other SSRIs in helping patients (4).

The focus of this study was to examine changes in fluvoxamine usage since the pandemic. Fluvoxamine is a well-tolerated SSRI with strong anti-inflammatory properties that is used to treat individuals with obsessive compulsive disorder (OCD) among other illnesses (6). Due to fluvoxamine being a highly potent sigma-1 agonist receptor which significantly reduces inflammation, this has been extremely beneficial in aiding in the recovery of COVID-19 patients (7). To date, there have been three randomized controlled trials conducted examining fluvoxamine and its use in COVID patients. The first double-blind, placebo-controlled, randomized clinical trial found that there was no significant clinical deterioration in COVID patients who took fluvoxamine, whereas patients in the placebo group experienced notable clinical deterioration (8). Although investigations completed thus far note that fluvoxamine is promising in the treatment of early stages of COVID-19, more randomized control trial studies are needed to further understand the role this drug has in treatment of SARS-COV-2. Evidence shows there was a statistical difference with fluvoxamine usage versus placebo to combat COVID-19 symptoms. The objective of this report was to examine the changes in fluvoxamine prescribed to Medicaid patients.

Methods

Participants

Medicaid enrollees in all 50 states and the District of Columbia were examined for years 2019, 2020, and 2021. The Medicaid State Drug Utilization Database (SDUD) dataset was utilized to collect data. Medicaid eligibility varies by each state. To meet the Medicaid criteria, individuals generally must be confirmed as pregnant, resource limited, or of low income (9).

Procedures

Prescriptions were obtained from the Medicaid SDUD and U.S. Census Bureau population database (10–11). The Medicaid SDUD collects quarterly data with annual updates. The most recent data made accessible to the public was from February 2022. To view statistical information, SDUD datasets of specified years were downloaded onto an Excel spreadsheet. There were 15 columns. Data included managed care organizations, state, national drug code, labeler code, product code, package size, year, quarter, suppression used, product name, unit prescription, units reimbursed, total amount reimbursed, Medicaid amount reimbursed, and non-Medicaid amount reimbursed. We used the state and unit prescription columns to gather data. We initially searched for fluvoxamine, then its trade names of fluvox, luvox CR, faverin, and fluvoxin under product name. Only fluvox yielded results with this search strategy. This gave us the ability to compare amounts of fluvoxamine dispensed throughout the U.S. for individuals using Medicaid. Some data was missing due to the transition from the SDUD to the new platform of Medicaid Drug Program system (MDP). Quarters 2, 3, and 4 for the year 2021 will be

made available in early 2022. We extracted estimated population totals per state from the population and housing unit estimate datasets from the U.S. Census Bureau.

Data analysis

Heatmaps and bar graphs were used to observe where fluvoxamine was being prescribed throughout the country and during what year. Geographical heatmaps from JMP statistical software were used to quantify specific states where the most fluvoxamine was prescribed. Areas of deep red indicate higher prescription rates.

Results

Each year fluvoxamine prescriptions fluctuated from 2019 to 2021 for Medicaid enrollees. Pre-pandemic, fluvoxamine was used similarly throughout the U.S. In 2019, fluvoxamine prescriptions totaled 374,334 throughout the country (10). The number of prescriptions in 2020 increased considerably to 398,035 (6.3%) (10). During 2021 there was a dramatic increase in prescriptions of fluvoxamine to 101,433 for quarter 1 in certain parts of the country (10). Certain states were omitted due to a small or absent record of fluvoxamine prescriptions. Omitted states had a value of 0. New York had the highest number of written prescriptions, totaling 24,507 during the pandemic as opposed to pre-pandemic of 22,500 (Figure 1 and 2, respectively). In 2021, New York nearly reached 7,000 prescriptions, totaling 6,576 in quarter 1 (Figure 3). Wyoming had the least number of fluvoxamine prescriptions written. Southern and northeastern regions of the U.S. had a significantly higher number of prescriptions for Medicaid enrollees compared to the Pacific Northwest and north-central regions.

Discussion

Fluvoxamine is primarily used as a treatment for OCD, depression, and anxiety disorders but it was widely used in the U.S. during the pandemic. It is unclear on how many prescriptions were given to patients diagnosed with mental disorders versus those who were using the prescription for COVID-19. However, it has a positive effect on patients who had mild to moderate COVID-19 symptoms (5-7). This could possibly explain the increase of prescriptions throughout the U.S. A major finding in this study shows that fluvoxamine has become a valuable drug during the national health crisis.

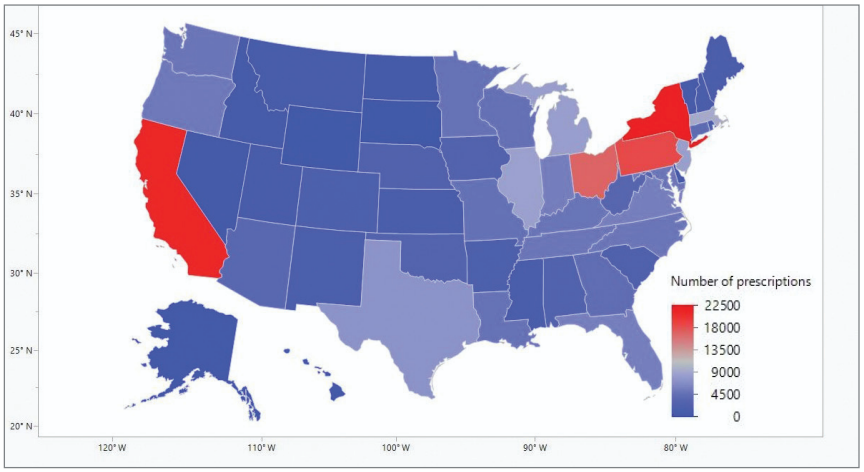

Figure 1. 2019 state-level heatmap of fluvoxamine in quarter 1 to 4. Total number of fluvoxamine prescriptions dispensed by each state from Medicaid agencies.

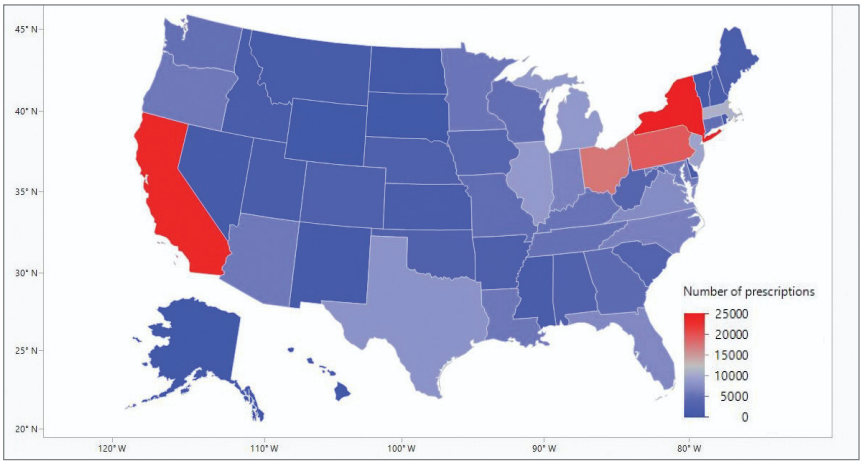

Figure 2. 2020 state-level heatmap of fluvoxamine in quarter 1 to 4. Total number of fluvoxamine prescriptions dispensed increased significantly from 2019.

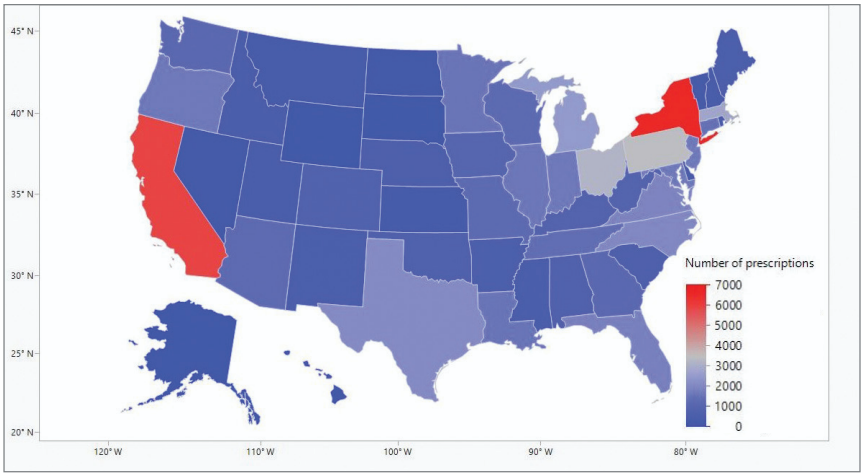

Figure 3. 2021 state-level heatmap of fluvoxamine in quarter 1. Quarter 2 and 3 is unavailable due transition of reporting State Drug Utilization Database (SDUD) to the new Medicaid Drug Program system (MDP). Total number of fluvoxamine prescriptions dispensed by each state from Medicaid agencies.

One major limitation of this study was that only the Medicaid database was used to search fluvoxamine. The limitation to using Medicaid as the core database is that each state has unique set guidelines within the federal law to determine whether certain individuals are eligible for Medicaid. Thus, participants recorded on the SDUD will vary and are inconsistent in selection. Additionally, Medicaid enrollees may have difficulty finding a healthcare provider that accepts their healthcare insurance. Even if patients manage to find a provider that accepts their insurance, providers, especially mental health providers, struggle to meet the demands of patients, thereby generating a long waitlist before patients can see their provider amid COVID-19. When less Medicaid enrollees are being seen, this impacts the amount of fluvoxamine prescribed during and after COVID-19. For future research, this project could incorporate multiple databases for a more complete representation of drug utilization associated with the pandemic.

Conclusion

Since COVID-19, there has been a pattern of increasing fluvoxamine distribution in all 50 states and the District of Columbia with Medicaid. This SSRI shows promising treatment for COVID-19 symptoms. The state with the lowest prescription rate was Wyoming with prescription utilization of 29 in 2019, 13 in 2020, and 0 for the first quarter in 2021. As predicted, New York had the largest usage of 24,507 prescriptions administered for outpatient Medicaid patients in 2020 compared to before the pandemic of 22,809 in 2019. Then 6,576 fluvoxamine prescriptions in the first quarter of 2021. We hypothesize this increase shows that fluvoxamine may have been utilized as either a form of treatment for COVID-19 patients or treatment for a spike of OCD symptoms due to associated stress from the virus.

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Disclosures

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