Biological and Clinical Sciences Research Journal
eISSN: 2708-2261; pISSN: 2958-4728
www.bcsrj.com
DOI: https://doi.org/10.54112/bcsrj.v2022i1.858
*Biol. Clin. Sci. Res. J., Volume, **2022**: 858*
Original Research Article

DRUG-DRUG INTERACTIONS IN PSYCHIATRIC PATIENTS: IDENTIFYING HIGH-RISK COMBINATIONS AND MITIGATION STRATEGIES

SHAMSHAD H[1], SHAMSHAD S[2]*

[1]*Department of Computer Science, Sarhad University of Science & Information Technology, Peshawar 25000, Pakistan*
[2]*Department of Pharmacy, Lady Reading Hospital Peshawar 25000, Pakistan*
Corresponding author`s email address: Sadaf.Shamshad@lrh.edu.pk

(Received, 09th March 2022, Revised 26th June2022, Published 5th July2022)

Abstract: *Psychiatric patients are at a high risk of severe adverse drug events (ADEs) due to potential drug-drug interactions (DDIs). These interactions can worsen existing health conditions and complicate treatment outcomes. Objective: This study aimed to identify and evaluate the drug-drug interactions (DDIs) of psychoactive drugs among mental health patients and propose effective prevention measures. A retrospective study was conducted at the Department of Pharmacy, Lady Reading Hospital, Peshawar, from January 1, 2021, to July 31, 2021. The study included all psychiatric patients treated during this period. Medication records were re-examined to identify drug-drug interactions (DDIs) using reliable drug interaction databases. Adverse effects resulting from these interactions were documented. Statistical analysis assessed the frequency and severity of the identified DDIs. Mitigation strategies were developed based on the probability and clinical relevance of the interactions. These strategies included drug adjustments, regular monitoring of patients, and patient education aimed at reducing the risk of adverse effects. The major DDIs frequently occur with commonly used psychiatric medications such as antipsychotics, antidepressants, and mood stabilisers. Common adverse effects included sedation, cardiovascular complications, and increased risk of serotonin syndrome. Mitigation measures, such as drug adjustment, regular monitoring, and patient education, were suggested to reduce the risk of adverse effects. Psychiatric patients are predisposed to severe ADEs due to DDIs, which are often difficult to predict. Mitigation measures such as appropriate drug adjustments and patient education are essential to enhance patient safety and treatment outcomes.*

Keywords: Adverse Drug Event, Drug-Drug Interactions, Mental Health, Mitigation Strategies, Patient Safety, Psychiatric Patients, Psychotropic Drugs

Introduction

Psychiatric forms of illness usually are highly complicated cases to resolve as different comorbidities and the daily use of several medications interact with them. Comorbidity-based polypharmacy is a problem when psychiatry is done on the background of some other medical conditions since such disorders may increase the possibility of drug-drug interactions (DDIs) as well as chances of side effects. Placing the essence of compassion and care in treatment delivery that does not deteriorate the health status is essential for the safety and effectiveness of mental health care. Published data that depicts the number of DDIs among psychiatric patients must be looked into to understand the issue further. The range of 30% to 50% of patients with psychiatric problems who have clinically significant drug-drug interactions are caused by the chronic use of psychotropic medications and other drugs for comorbidity disorders (Khan et al., 2017; Lee et al., 2012). Also, psychotropic drugs have narrow ranges of therapeutic indices, and the risk of these drugs becoming involved in pharmacokinetic and pharmacodynamic interactions is high. Consequently, it becomes a hardship to treat these patients (van Tongeren et al., 2020). the same psychiatric job includes serving people from various demographic groups. It is illustrative of the widespread and practical nature of DDI among psychiatric patients, which the healthcare staff has noted. Retroactive analysis of the medicine records at LRH seems to be a kind of instrument to decide the most common interactions that mainly affect certain groups of patients. I think recognising and reducing the chances of DDIs in psychiatric patients would be a critical point in the treatment of such patients. The wide range of potential outcomes may range from benign afflictions to critical reactions and, in some cases, even death if the variety and complexity of interactions do not get successfully treated or appropriately diagnosed on time (Guo et al., 2012). Patients with mental disorders typically are a specific risk group for medication adverse events because of their biological susceptibility to the side effects of medication and the influence on the underlying psychiatric symptoms(Courlet et al., 2020; Reeve et al., 2018). Among these are the problems only psychiatric patients have, so it is crucial to have policies that reflect the patient's unique needs precisely. The process of carrying out the drug reconciliation, daily monitoring of drug regimens, therapeutic drug monitoring, dose adjustment, and educational process on medication will lead to the patient taking the medications on time and understanding the risk of not carefully following the prescribed regimen.

Methodology

A retrospective evaluation of the medical system of 200 patients with psychiatric illnesses admitted to Lady Reading Hospital, Peshawar, from January 2021 to July 2021 was carried out. The form of drug-drug interactions (DDIs) was

asses based on dependable databases, and the possible adverse consequences were noted. The subjects, detailing age, gender, and past psychiatric diagnoses, were recorded. Given the degree of significance and relevance of the interactions in the reflection of disease conditions, it maintained strategies. Analysis, statistics, descriptive association, and testing were done to examine the prevalence of DDIs with patient traits.

The psychiatric records of 200 patients between 01st January 2021 and the 31st July 2021 were retrospectively reviewed. Patient information, diagnostic procedures, and medication uses were examined. Dispensaries and pharmacies were consulted to use their drug interaction databases, and the database was updated regularly to document the adverse effects in patient records.

Through SPSS (Statistical Package for the Social Sciences version 27), descriptive statistics (a set of statistical tools utilised to describe the group characteristics) were used. One of the things that I did was to include all the patient demographics, psychiatric diagnoses, and medication profiles; we employed the test of Fisher's exact or the Chi-square, whichever was appropriate, to evaluate the association between polypharmacy and the risk of drug-drug interactions, the significance level was set to p-value <0. 0.5

Results

The key DDI among psychiatric patients was the broad cases of such interactions where 25 interactions between SSRIs and MAOIs were detected, representing 12% of all DDIs—5% of interactions. Additionally, 15 cases of interaction between antipsychotics and benzodiazepines demonstrate that there is a relationship between them—5% of interactions. Employing antidepressants with lithium (5%), antipsychotics and amitriptyline (4%), benzodiazepines with opioids (6%), and antipsychotics with antidepressants (9%) are among the most influencing interactions. Some severe side effects were reported during these interactions, as shown by the following percentage: dizziness (20%), nausea (15%), agitation (12%), sedation (18%), respiratory depression (10%), and headache (8%). These results point out how high-risk DDIs are widespread among psychiatric patients, some of which show the percentage where interactions may occur between particular medication groups. Alongside this range of adverse effects, however, this is a strong indication of the need for regular monitoring and applicable intervention systems whose primary role is to ensure patient safety and treatment results are optimal at the same time.

Table 1: Demographic Characteristics of Psychiatric Patients (n=200)

Characteristic	Number (%)
Mean Age (years)	42 (± 5)
Gender	
- Male	120 (60%)
- Female	80 (40%)
Diagnosis	
- Major Depressive Disorder	70 (35%)
- Schizophrenia	50 (25%)
- Bipolar Disorder	40 (20%)
- Others	40 (20%)

Table 2: Prevalence of High-Risk Drug-Drug Interactions (DDIs) in Psychiatric Patients (n=200)

Drug Class	Interactions Identified	Prevalence (%)
SSRIs + MAOIs	25	12.5
Antipsychotics + Benzodiazepines	15	7.5
Antidepressants + Lithium	10	5
Antipsychotics + SSRIs	8	4
Benzodiazepines + Opioids	12	6
Antipsychotics + Antidepressants	18	9

Table 3: Common Adverse Effects Associated with Identified Drug-Drug Interactions

Adverse Effect	Prevalence (%)
Dizziness	20
Nausea	15
Agitation	12
Sedation	18
Respiratory Depression	10
Headache	8

Table 4: Mitigation Strategies for High-Risk Drug-Drug Interactions

Strategy	Recommendation
Medication Adjustment	Adjust dosages or switch medications as appropriate.
Therapeutic Drug Monitoring	Monitor serum levels and adjust doses accordingly.
Patient Education	Educate patients about potential interactions and symptoms.

Table 5: Association between the Number of Medications Prescribed and the Likelihood of DDIs

Number of Medications	Likelihood of DDIs (p-value)
≤ 3	$p < 0.05$
4-6	$p < 0.05$
> 6	$p < 0.05$

Table 6: Summary of Key Findings

Key Finding	Recommendation
Significant prevalence of high-risk DDIs in psychiatric patients	Vigilant medication management and interdisciplinary collaboration
Identified interactions primarily involve SSRIs, MAOIs, antipsychotics, and benzodiazepines.	Tailored monitoring and patient education
Association between the number of medications and the likelihood of DDIs	Streamlined prescribing practices and regular review of medications

[Citation: Shamshad, H., Shamshad, S. (2022). Drug-drug interactions in psychiatric patients: identifying high-risk combinations and mitigation strategies. *Biol. Clin. Sci. Res. J.*, **2022***: 858*. doi: https://doi.org/10.54112/bcsrj.v2022i1.858]

Discussion

The drug-disease interactions at high risk (DDIs) are of considerable concern in patients with psychiatric illness. SSRIs were the most frequently interacting with each other (at 12. 5%), and MAOIs were the ones that interacted with SSRIs more often (Kooij et al., 2019). when the antipsychotics and benzodiazepines were used together, it was the reason for 7. 5% of the cases in the study. The research that was mentioned before presented evidence and this evidence proves that the proper drug regimen for psychiatric patients is very complex. This is why pharmacists should be free to substitute drugs; thus, this will prevent damaging drug interactions that will harm patients (Singh, 2019). Some of the noted side effects of two DDIs included dizziness (20%) and nausea (15%), whereas the induced incidences of two DDIs were sedation (18%), respiratory depression (10%), and headache (8%) (Fasinu et al., 2012). The devastating consequences of drug-drug interactions are the reason why the clinical significance of such interactions has become an issue of great importance, and ways to reduce patient harm are necessary for preventive management systems. Research finds several measures, like prescription modification, targeted drug monitoring, and patient advice, are effective (Jose et al.). With these approaches, a doctor would like to perfect the therapy he prescribes, lessen and prevent adverse effects as much as possible, and get patients involved in their kind of therapy. By embracing these measures, healthcare providers like psychiatrists, mental health workers, and other healthcare institutions can increase patients' safety and effectiveness by ensuring the quality of psychiatric care services (Zarkowski, 2020). Our work conforms to and is based on clinical practice that involves drug interactions among psychiatric patients, which is supported by the established literature. Correspondingly, many case reports with a high incidence of DDIs among geriatric patients have been published and quoted the risk factors and problems. However, this is the first local study highlighting the problem (Protti et al., 2020) research on MAOI and SSRI interaction at a mental hospital. Their findings showed that the numbers were the same, foreshadowing the significance of routine controls and treatments (Guo et al., 2012). Unlike the review that was carried out by the PSychE group and was headed up by Jones et al. (2020), our paper has reported a problem of antipsychotic-benzodiazepine drug interactions that usually occur in the process of regular psychiatric practice (Sarkar, 2017; Wang et al., 2001). Our work significantly contributes to the literature by suggesting special programs to be included in treating mental health patients. The investigations of earlier studies concentrate on how pharmacokinetic interactions can be prevented by providing optimal medication management in psychiatry inpatient units, and none of them has given a practical approach (Hiemke et al., 2011; Manolis et al., 2019). Our study addresses this issue and fills the knowledge gap for healthcare workers to ensure the best patient care and safety. One of the aspects of the research mentioned is that it has limitations. The consideration of these factors must be taken from a research standpoint. Our retrospective approach is often not as conclusive as one would like, not because we do not receive enough data but because data collection and interpretation may be biased. On the other hand, the current research was carried out at a single centre in our hospital. Our data may lose their generalizability in a healthcare context other than ours. Future works should address the present deficiencies by designing prospective randomised studies on more significant groups of patients in a multicenter setting.

Conclusion:

This study highlighted the high rate of DDIs with high-risk potential among psychiatric patients and the severe adverse reactions that often accompany these interactions. We plan to put in place individualised mitigation measures such as medication adjustment and patient education, among others, to achieve good treatment outcomes and enhance patient safety. This research emphasises the importance of preventive management of DDIs in hospital settings to have better patient care results.

Declarations

Data Availability statement
All data generated or analysed during the study are included in the manuscript.
Ethics approval and consent to participate
Approved by the department concerned.
Consent for publication
Approved
Funding
Not applicable

Conflict of interest

Data entry and data analysis, as well as drafting the article.

References

Courlet, P., Livio, F., Alves Saldanha, S., Scherrer, A., Battegay, M., Cavassini, M., Stoeckle, M., Decosterd, L. A., and Marzolini, C. (2020). Real-life management of drug–drug interactions between antiretrovirals and statins. Journal of Antimicrobial Chemotherapy 75, 1972-1980.

Fasinu, P. S., Bouic, P. J., and Rosenkranz, B. (2012). An overview of the evidence and mechanisms of herb-drug interactions. Frontiers in pharmacology 3, 69.

Guo, J. J., Wu, J., Kelton, C. M., Jing, Y., Fan, H., Keck, P. E., and Patel, N. C. (2012). Exposure to potentially dangerous drug-drug interactions involving antipsychotics. Psychiatric Services 63, 1080-1088.

Hiemke, C., Baumann, P., Bergemann, N., Conca, A., Dietmaier, O., Egberts, K., Fric, M., Gerlach, M., Greiner, C., and Gründer, G. (2011). AGNP consensus guidelines for therapeutic drug monitoring in psychiatry: update 2011. Pharmacopsychiatry 21, 195-235.

Jose de Leon, M., Sandson, N. B., and Cozza, K. L. Med-Psych Drug-Drug Interaction Update: A Preliminary Attempt to Personalize Risperidone Dosing Using Drug-Drug Interactions and Genetics.

Khan, Q., Ismail, M., Haider, I., & Khan, F. (2017). Prevalence of QT interval prolonging drug-drug interactions (QT-DDIs) in psychiatry wards of

tertiary care hospitals in Pakistan: a multicenter cross-sectional study. International journal of clinical pharmacy 39, 1256–1264.

Kooij, J., Bijlenga, D., Salerno, L., Jaeschke, R., Bitter, I., Balazs, J., Thome, J., Dom, G., Kasper, S., and Filipe, C. N. (2019). I updated the European Consensus Statement on diagnosing and treating adult ADHD. European psychiatry 56, 14-34.

Lee, H.-Y., Li, J.-H., Wu, L.-T., Wu, J.-S., Yen, C.-F., and Tang, H.-P. (2012). Survey of methadone-drug interactions among patients of methadone maintenance treatment program in Taiwan. Substance abuse treatment, prevention, and policy 7, 1-12.

Manolis, T. A., Manolis, A. A., and Manolis, A. S. (2019). Cardiovascular safety of psychiatric agents: a cautionary tale. Angiology 70, 103-129.

Protti, M., Mandrioli, R., Marasca, C., Cavalli, A., Serretti, A., and Mercolini, L. (2020). New-generation, non-SSRI antidepressants: Drug-drug interactions and therapeutic drug monitoring. Part 2: NaSSAs, NRIs, SNDRIs, MASSAs, NDRIs, and others. Medicinal Research Reviews 40, 1794-1832.

Reeve, E., Moriarty, F., Nahas, R., Turner, J. P., Kouladjian O'Donnell, L., & Hilmer, S. N. (2018). A narrative review of the safety concerns of deprescribing in older adults and strategies to mitigate potential harms. Expert opinion on drug safety 17, 39–49.

Sarkar, S. (2017). Psychiatric polypharmacy, aetiology and potential consequences. Current Psychopharmacology 6, 12–26.

Singh, A. K. (2019). Alcohol interaction with cocaine, methamphetamine, opioids, nicotine, cannabis, and γ-hydroxybutyric acid. Biomedicines 7, 16.

van Tongeren, J., Harkes-Idzinga, S., van der Sijs, H., Atiqi, R., van den Bemt, B., Draijer, L., Hiel, D., Kerremans, A., Kremers, B., and de Leeuw, M. (2020). The development of practice recommendations for drug-disease interactions by literature review and expert opinion. Front. Pharmacol. 11, 707 (2020). POLICY AND PRACTICE REVIEWS published 15.

Wang, P. S., Bohn, R. L., Glynn, R. J., Mogun, H., and Avorn, J. (2001). Hazardous benzodiazepine regimens in the elderly: effects of half-life, dosage, and duration on risk of hip fracture. American Journal of Psychiatry 158, 892-898.

Zarkowski, P. A. (2020). Relative prevalence of 10 types of pharmacodynamic interactions in psychiatric treatment. The International Journal of Psychiatry in Medicine 55, 82-104.