

International Journal of Pharmacy and Pharmaceutical Science

ISSN Print: 2664-7222
ISSN Online: 2664-7230
Impact Factor: RJIF 8
IJPPS 2023; 5(2): 45-51
www.pharmacyjournal.org
Received: 12-06-2023
Accepted: 19-07-2023

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Assessment of prescribing trends and risk of antiviral drugs in inpatients of tertiary care hospital

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DOI: <https://doi.org/10.33545/26647222.2023.v5.i2a.43>

Abstract

Antiviral agents are crucial for managing viral infections, serving various roles, from prevention to treatment. Understanding their prescription patterns and risks is vital for optimizing clinical use. This study aims to observe prescription patterns and assess risks associated with antiviral drugs among inpatients at a tertiary care hospital. Objectives include evaluating prescription patterns across departments, identifying commonly prescribed antivirals, and monitoring associated risks. A prospective observational study was conducted over six months at a 450-bed tertiary care hospital. Inpatients receiving one or more antiviral drugs were included; ICU and outpatient cases were excluded. Medical records from over 100 patients were evaluated, with prescription trends and risk data recorded in a standard form. Data analysis utilizes graphical methods. The study found that 52% of participants were female, with most in the 61-70 and >80 age groups. Oseltamivir was the most frequently prescribed antiviral (56.5%), predominantly in the general medicine department (47.8%). Antivirals were commonly prescribed for lower respiratory tract infections (38.3%) in capsule form (35.6%). Most prescriptions were for lower respiratory tract infections in the general department (47.8%), including COVID-19 cases. No significant drug interactions were detected. Based on analysis of 115 prescriptions, this study revealed Oseltamivir as the most commonly prescribed antiviral, mainly for lower respiratory tract infections. Antiviral drugs were deemed safe for treatment, with no significant risks identified. The research underscored common antiviral use among the geriatric population. Overall, this study provides insights into prescription trends and risk assessment, enhancing understanding and safe use of antiviral agents in a tertiary care hospital.

Keywords: Antiviral, oseltamivir, lower respiratory tract infection, COVID, remdesivir

Introduction

Viruses are the main pathogenic agents in a large number of serious diseases that affect humans, other animals, and plants.

Antiviral medications are a subclass of pharmaceuticals used specifically to treat and manage viral infections. Many viral infections cannot be treated with efficient antiviral medications. However, there are a number of medications for treating influenza, a few medications for treating herpes viruses, and some new antiviral medications for treating HIV and hepatitis C infections. Antiviral medications typically target distinct phases of the viral life cycle. In the viral life cycle the target stages are; viral attachment to host cell, uncoating, synthesis of viral mRNA, translation of mRNA, replication of viral RNA and DNA, maturation of new viral proteins, budding, release of newly synthesized virus, and free virus in body fluids. There are currently few antiviral medications available for the treatment of viral disorders, and at least half of those medications are used to treat human immunodeficiency virus (HIV) infections. The others are used for the management of herpes simplex virus (HSV), varicella zoster virus (VZV), cytomegalovirus (CMV), hepatitis B virus (HBV), hepatitis C virus (HCV), respiratory syncytial virus (RSV), human papillomavirus (HPV), and influenza virus-related diseases^[1]. The development of antiviral medications focuses on either targeting host cell components or the viruses themselves. Antiviral medications that directly target viruses include integrase inhibitors, protease inhibitors, polymerase inhibitors, nucleoside and nucleotide reverse transcriptase inhibitors, and entrance, uncoating, and attachment inhibitors.

Viruses employ the host cell's metabolic processes to create new virus particles in addition to stealing nutrients from the cell. Drugs that target particular phases of a virus, such as cell penetration, uncoating, reverse transcription, virus assembly or maturation, etc., have also been produced. To be effective, therefore, therapy has to be started in the incubation period, i.e. has to be prophylactic or preemptive [2].

Materials and Methods

Study Design

A prospective observational study was conducted in a tertiary care hospital for a period of 6 months having not less than 100 patients. Inpatients of either gender, irrespective of their age, admitted into general medicine, pediatrics, cardiology, isolation ward and surgery department in a 450 bedded tertiary care hospital were included in the study. Also, patients prescribed with at least one antiviral agent were also selected. Out patients and ICU patients were excluded.

Study sample size

Data records of 115 patients from general medicine, pediatrics, cardiology, isolation ward and surgery department were included in the study. Also patients prescribed with atleast one antiviral agents were also selected.

Data Collection

Data was collected using data entry form and they were analysed and the results are shown by graphical method.

Results

Distribution based on gender (N=115)

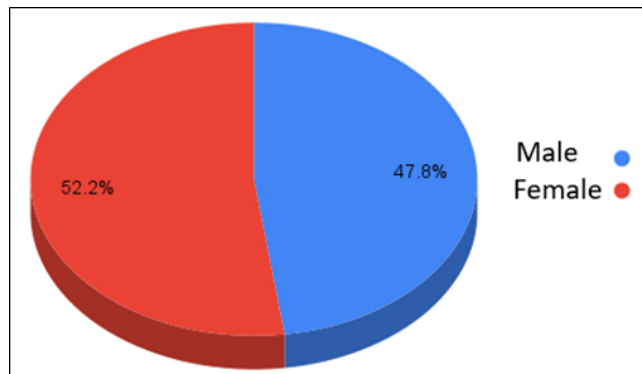


Fig 1: Distribution based on Gender

The graph based on gender distribution shows 52% of the patients were female.

Distribution based on age (N=115)

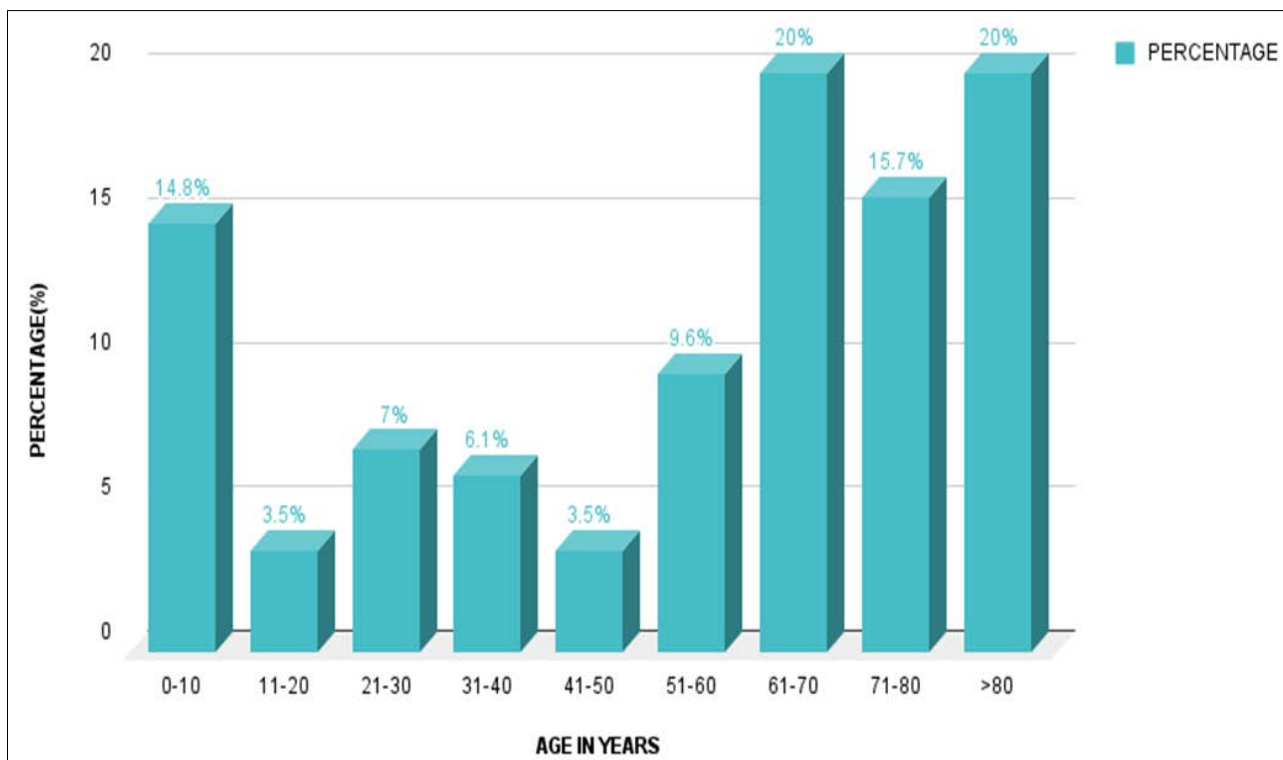


Fig 2: Distribution based on Age

The graph represents the number of patients participating in

the study fell in the age group of 61-70 (20%) and >80 (20%).

Distribution based on departments (N=115)

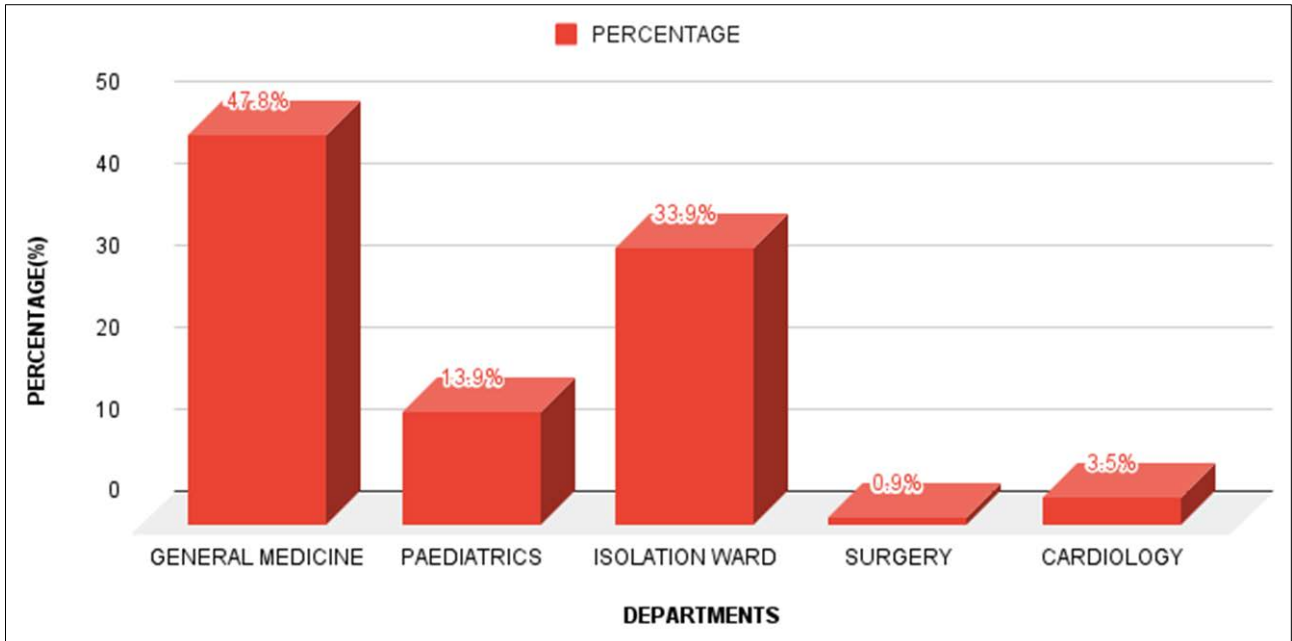


Fig 3: Distribution based on Departments

The graph represents that distribution based on departments was more on the general medicine department (47.8%).

Distribution based on diagnosis (N=115)

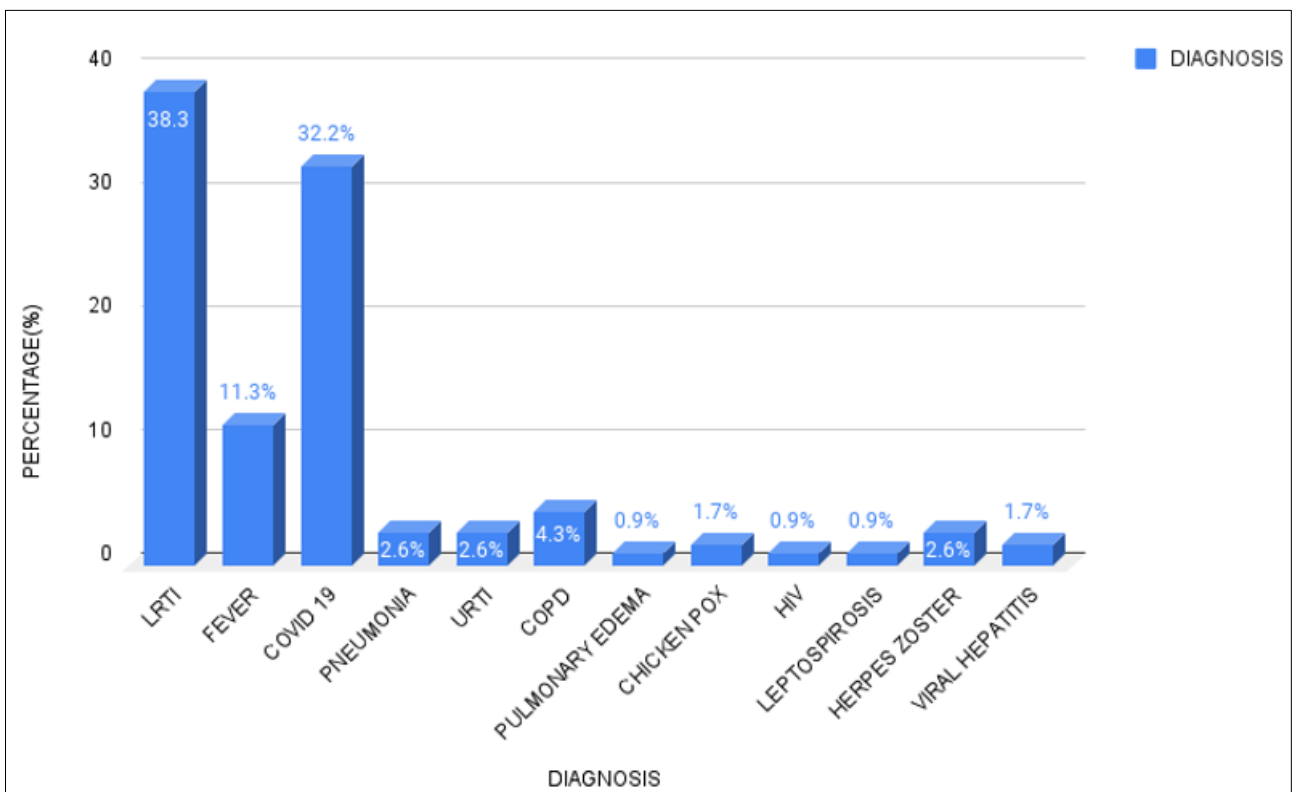


Fig 4: Distribution based on Diagnosis

The graph shows that most of the antivirals were prescribed for the LRTI condition (38.3%)

Distribution based on classification of antiviral drugs prescribed (N=115)

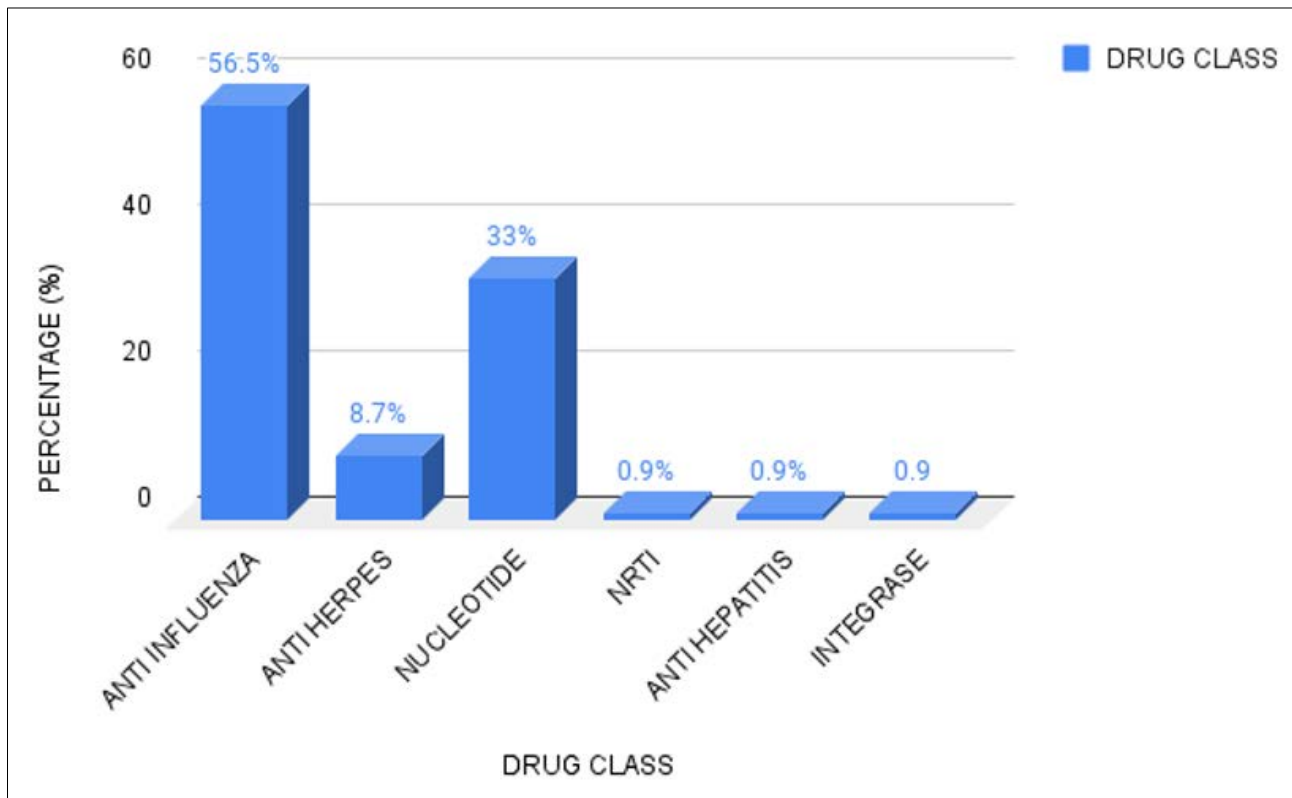


Fig 5: Distribution based on Class of Antiviral Prescribed

The graph shows most of the antivirals prescribed belong to the class of anti-influenza agents (56.5%).

Distribution based on type of antiviral prescribed (N=115)

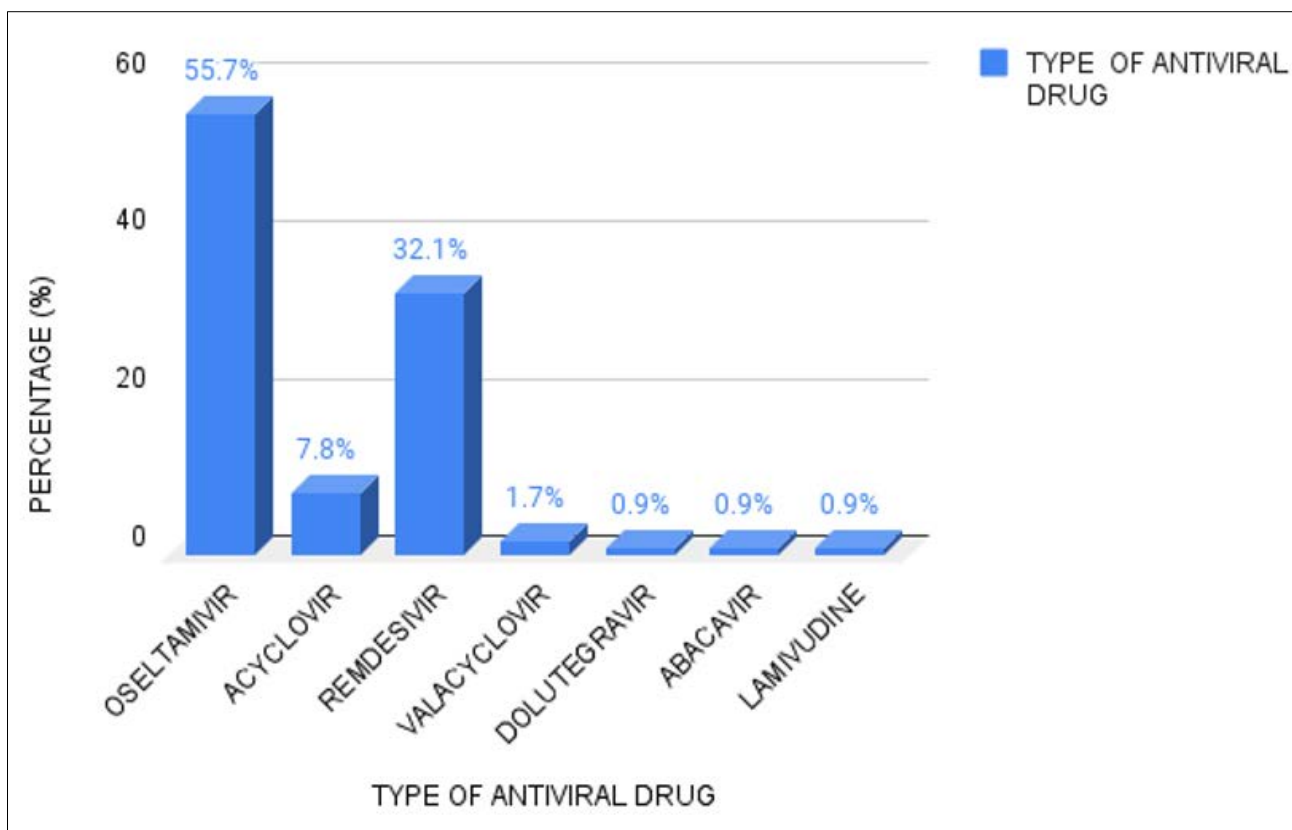


Fig 6: Distribution based on type of Antiviral prescribed

The graph based on type of antivirals prescribed demonstrates that oseltamivir is the most commonly prescribed antiviral agent (55.7%).

Distribution based on COVID-19 history (N=115)

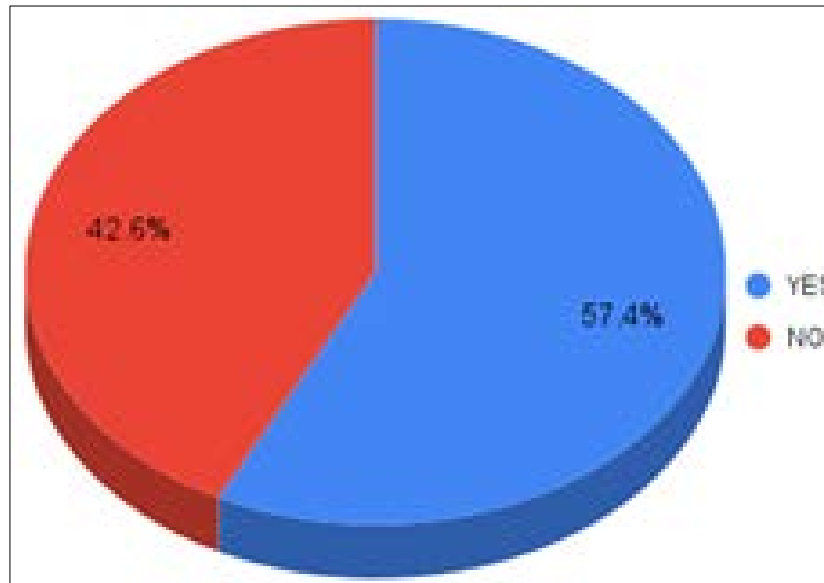


Fig 7: Distribution based on Covid-19 History

The above graph shows most of the patients who had taken antiviral agents had a COVID-19 history (57.4%).

Distribution based on side effects (N=115)

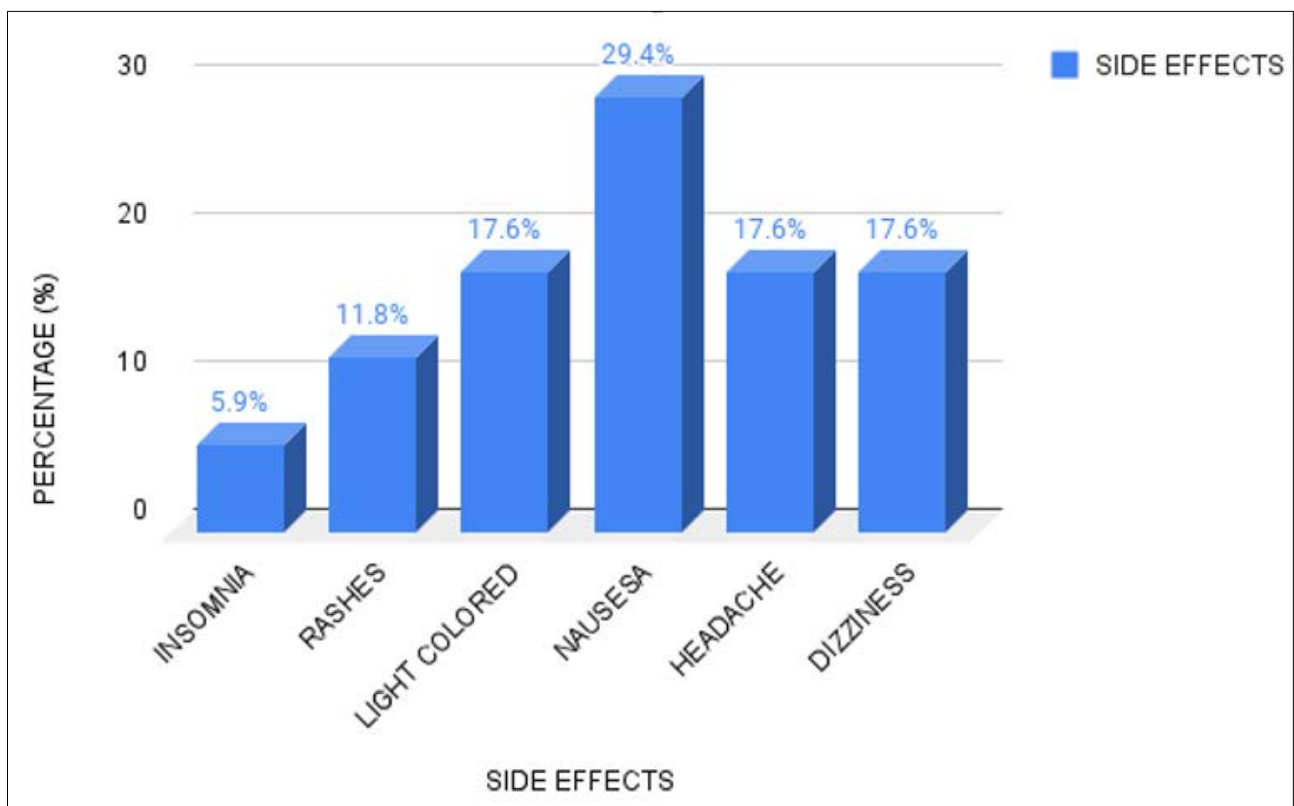


Fig 8: Distribution based on side effects

The graph based on side effects shows that nausea is the most commonly reported side effect of the antiviral drugs (29.4%).

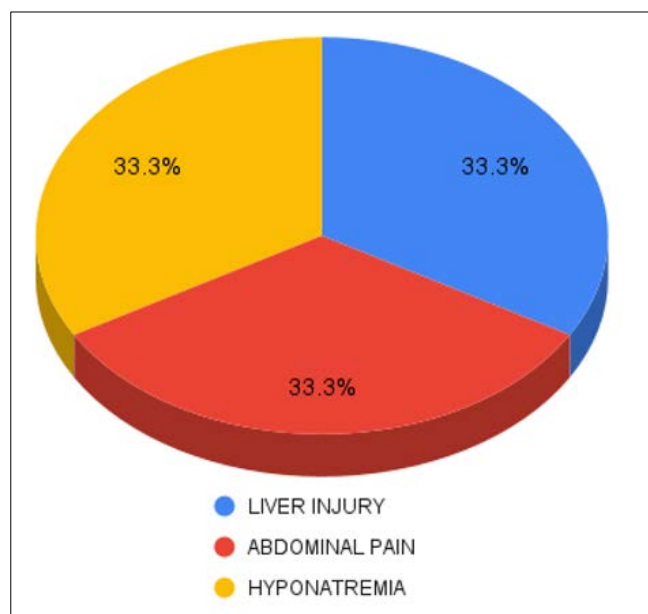
Distribution based on adverse drug reaction (N=115)

Fig 9: Distribution based on adverse drug reactions.

The above graph based on adverse drug reactions shows that liver injury, abdominal pain and hyponatremia were the commonly reported adverse drug reactions of antiviral agents which exhibited an equal percentage of distribution (33.3%).

Discussion

Antiviral drugs are those which are used to treat a variety of viral disorders. Many classes of antiviral drugs are available in which each specific class indicates specific action on various viral disorders. Anti-influenza and nucleotide analogue drugs are most commonly prescribed indicated for treating respiratory tract infections. They are administered orally as tablet and capsule forms, intravenous dosages and topical dosage forms.

A prospective and retrospective study was conducted on patients who were admitted to general medicine, pediatrics, cardiology, surgery and isolation departments for a period of 6 months. The prescriptions of patients with antiviral drugs were evaluated to identify the prescribing pattern and risk factors associated by checking the side effects and ADR developed and also by checking the drug-drug interactions with antivirals using online internet databases such as Medscape and Micromedex.

Conclusion

The current study was conducted to assess the prescribing trends and risks of antiviral drugs in a tertiary care hospital with the help of online internet databases such as Micromedex and Medscape. The study was conducted and 115 prescriptions were analyzed. The study concluded that antiviral drugs were frequently prescribed in the general department and most commonly prescribed drug was oseltamavir. The most common route of administration was oral route and dosage form was tablets. The disease condition for which these drugs were prescribed was lower respiratory tract infection. The number of days of hospital stay was 3-6. The analysis revealed that there are no significant drug interactions with antiviral drugs. The risk

factors like age, gender, type of antivirals prescribed, number of days prescribed, indication, etc. were also evaluated. The study concluded that prescribed antiviral drugs in the hospital is safe and used in treatment of viral infections.

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