

ANALYSIS ON DRUG INTERACTIONS IN THE PRESCRIPTION OUTPATIENT TREATMENT AT BEN CAT TOWN, BINH DUONG PROVINCE

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Abstract

Drug interactions are a common problem in treatment, especially in the multi-pathological and multi-symptomatic state that requires the use of multiple drugs. Therefore, patients are more likely to experience drug interactions. Through a survey of drug interactions occurring during outpatient prescribing at Ben Cat Town Medical Center in the first 6 months of 2022 and according to the survey results of 400 prescriptions about number of drugs, number of diagnoses, rate of prescriptions with interactions and pairs of drugs with interactions, the rate of prescriptions with interactions looked up by Drug.com and Medscape.com is 13.25% and 14%, respectively. There are 35 drug pairs with interactions: 8 pairs of drug with severe interactions, 21 pairs of drugs with moderate interaction, 6 pairs of mild drug interactions. Therefore, it is necessary to have a long-term training plan on drug interactions for prescribing doctors as well as to invest in a software system to look up drug information, in which, drug information training is the most important step to reduce the incidence of drug interactions.

Keywords: Drug interaction, Outpatient, Adverse drug reaction (ADR).

1. Introduction

Using drugs safely, rationally and effectively is one of the national policies of Vietnam. The inappropriate and ineffective prescribing and use of drugs significantly increases the costs for patients, increases the risk of drug interactions and even the risk of death. Using drugs safely, rationally and effectively in the context of an abundant, diverse and diverse supply of drugs, with increasing drug resistance and limited ability to pay for patients is a concern and a significant challenge for current medical examination and treatment facilities (Ministry

of Health, 2014; Ministry of Health, 2018; Doan Kim Phuong, 2017).

For many chronic diseases such as hypertension, diabetes mellitus... the treatment with a single drug frequently does not result the expected therapeutic effect. To improve and increase the effectiveness of treatment, doctors often prescribe a combination of many different drugs. During long-term use of the drug, there is a risk of adverse effects and side effects that can cause new illnesses, which can be serious, long-term disability, or even death.

Over the years, Ben Cat Town Medical

Center has always emphasized the safe, effective and suitable use of drugs to improve the quality of treatment and attract patient satisfaction.

Monitoring and detecting drug interactions is very necessary in treatment, the purpose of drug interaction research is to help us better understand the situation of drug interactions, make recommendations to control prescriptions, drug interactions, handle adverse drug interactions and timely. Therefore, we carry out the research “The current situation of drug interactions in outpatient prescriptions at Ben Cat town health center in the first 6 months of 2022” with the goal: to investigate drug interactions occurring during the treatment process, prescription for outpatient treatment at Ben Cat Town Medical Center.

2. Related research overview

Research on drug interactions and indications (Ministry of Health, 2014) is a scientific basis to help doctors practice good prescribing, pharmacists practice good pharmacy and nurses practice proper drug use, monitor symptoms abnormal behavior of the patient while taking the drug. Especially, in cases where it is imperative to combine drugs for the patient, the doctor can predict and prepare to handle when an adverse interaction occurs. This study also helps doctors, pharmacists and nurses to assess the risk to patients on a case-by-case basis, in order to do it reasonably and safely. In fact, in Vietnam and in the world, recent studies have focused on drug-drug interactions, pharmacokinetics, adjuvant interactions, drug-food interactions, and effects of food to the pharmacokinetics, effects and toxicity of drugs, the influence of food on the pharmacokinetics, effects and toxicity of drugs, especially drug interactions - pathological states. On the other hand, research on drug interactions helps doctors have more reasonable and safe treatment indications.

The information on drug interactions is always fully updated and annually on the National Pharmacopoeia of Vietnam, which has gathered drug information regularly updated by the Ministry of Health and compiled new monographs. In 2011, there are

150 drug treatises which were revised, supplemented, updated with 10 new drug treatises. In 2018, the drug treatises were gathered together with 540 newly compiled treatises to form the second edition of the National Pharmacopoeia of Vietnam, including 700 drug treatises and 24 general theses, helping medical staffs easy to look up and use drug information, especially information on drug interactions, gathered from many countries around the world such as UK, France, USA...

Some practical studies in Vietnam also have new discovery such as the research: “Survey on the situation of drug prescribing in outpatient treatment at the Medical Center of Phu Giao district, Binh Duong province in 2015” by the author Doan Kim Phuong (2017).

Drugs.com is the most popular, comprehensive and up-to-date online source of drug information, providing free, peer-reviewed, accurate and independent data on more than 24,000 prescription drugs, over-the-counter drugs, and natural products. Drugs.com is also an online pharmacy encyclopedia that provides drug information to consumers and healthcare professionals, primarily in the United States.

Medscape.com is used in this area of research as it is the source of the latest medical news received on clinical trial coverages, drug updates, journal articles and CME activities.

Action Plan on Essential Medicines and Vaccines (1993) was received by WHO (WHO, 1993), on how to investigate drug use in health facilities: selected drug use indicators; a demonstration of the predictive anti-tumor efficacy of new ICI combinations if data on monotherapy are available; predicting side effects remains challenging and realizing promise in terms of drug resonance or increasing sensitivity may require better responsive biomarkers to identify patients with multiple components of an active combination therapy.

3. Subjects and methods

Research Methods: A cross-sectional descriptive study.

Subjects of the study: Prescriptions were prescribed to patients with health insurance for

outpatient treatment at Ben Cat Town Medical Center.

Sample selection criteria: Prescriptions were prescribed to patients with health insurance for outpatient treatment at Ben Cat Town Medical Center.

Exclusion criteria: Prescription for 01 drug; prescription for traditional medicine, hospital transfer prescription.

Research location: Faculty of Pharmacy - Ben Cat Town Medical Center.

Study period: From January 8th to June 30th, 2022.

Data collection methods and techniques:

- **Sampling method:** In the first 6 months of 2022, there were 12.945 outpatient health insurance prescriptions numbered respectively. There were 400 prescriptions (n = 400) selected using systematic sampling technique. Retrospectively, 400 prescriptions were carried out at the health insurance dispensary with prescription dates from January 2nd, 2022 to June 30th, 2022.

Data collection techniques: Each sample has its own data collection sheet. Drug interactions are analyzed and evaluated based on interaction review software Drugs.com; Medscape.com drugs are continuously updated to the present time.

Definition of drug interactions according to Drugs.com software (Drugs.com)

A drug interaction is an interaction between one drug and another, between a drug and a physiological or pathological state of the body, and possibly also with certain foods they take. The results of drug interactions make the drug increase or decrease the therapeutic effect, or give rise to some unwanted effects that are detrimental to the patient.

- Level 1: When looking up 2 drugs used simultaneously in a prescription into the software.

Drugs.com has a severe drug interaction (Major) result: clinically significant; avoid combinations; the risks of the interaction outweigh the benefits.

- Level 2: When looking up 2 drugs used simultaneously in a prescription into the software.

Drugs.com has a moderate drug interaction rating (Moderate): moderate clinical significance; usually avoid combinations; use it only in special cases.

- Level 3: When looking up 2 drugs used simultaneously in a prescription into the software.

Drugs.com has a minor drug interaction classification (Minor): minimal clinical significance; risk reduction; assess risks and consider an alternative drug, take steps to avoid potential interactions, and/or plan for monitoring.

Definition of drug interactions according to Medscape.com software.

- Serious (Serious)
- Monitor closely
- Light interaction (Minor)

Data processing and analysis: Calculate % value; the average value; data entry and processing by Microsoft Excel software

4. Research results

Factors belonging to the patient such as age, sex, number of diseases and the number of drugs used are risk factors for the interaction and consequences of the interaction. Investigate these factors to suggest factors that may affect the interaction to contribute to the prevention of prescription drug interactions.

Table 1: Patient information of 400 prescriptions

Age (years)		Number of diseases (%)
Content	< 6	18 (4.5)
	7 – 20	18 (4.5)
	20 – 40	68 (17)
	40 – 60	125 (31.25)
	> 60	171 (42.75)
Gender	Male	204 (51)
	Female	196 (49)

Comments: There are 4.5% of patients under 6 years, the rate of patients over 60 years has the rate of 42.75%. Male patients 51%, female patients 49%.

Table 2: Quantity of drugs in 400 prescriptions

Number of drugs/ prescription	Frequency (%)	Average number of drugs/ prescription
2	122 (30.5)	3.45
3	109 (27.25)	
4	87 (21.75)	
5	51 (12.75)	
6	18 (4.5)	
7	9 (2)	
8	4 (1)	
10	1 (0.25)	

Comment: The prescription has 2 drugs/prescription, 30.5%. The prescription has 10 drugs/prescription, 0.25%. The average number of drugs was 3.45 per prescription.

Table 3: Number of diagnoses in 400 prescriptions

Content	Frequency (%)
Prescription has 01 diagnosis	129 (32.25)
Prescription has 02 diagnosis	135 (33.75)
Prescription has 03 diagnosis	87 (21.75)
Prescription has 04 diagnosis	34 (8.5)
Prescription has 05 diagnosis	11 (2.75)
Prescription has 06 diagnosis	2 (0.5)
Prescription has 07 diagnosis	2 (0.5)
Total number of diagnoses	877
Average number of diagnoses/single	2.2

Comment: The prescription has 1 diagnosis of 32.25%, the prescription has 7 diagnoses of 0.5%. Total number of diagnoses 877, average number of diagnoses/single 2.2.

Table 4: Rate of prescriptions with interactions of 400 prescriptions

Content	Drugs.com	Medscape.com
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		Frequency (%)	
Prescriptions with interactions		53 (13.25)	56 (14)
In there	01 pair of interactions	43 (10.75)	45 (11.25)
	02 pairs of interactions	8 (2)	7(1.75)
	03 pairs of interactions	2 (0.5)	3 (0.75)
	04 pairs of interactions	0	1 (0.25)
Prescriptions with no interactions		347 (86.75)	344 (86)

Comments: According to Drugs.com 13.25% of prescriptions have interactions; Medscape.com 14% menu has interaction.

Table 5: Rate of drug interaction pairs by degree of 400 prescriptions

Content	Drugs.com	Medscape.com
	Frequency (%)	Frequency (%)
Severity	9 (14)	20 (27.7)
Average level	48 (75)	48 (66.7)
Low	7 (11)	4 (5.6)
Total	64 (100)	72 (100)

Comment: Drug.com search results for severe interactions is 14%, moderate 75%, mild 11%. According to Medscape.com search results, the drug pair interacts with a severe degree of 27.7%, an average level of 66.7%, a mild level of 5.6%.

Table 6: Drug pairs with interactions according to Medscape.com and Drugs.com

Drug pairs with interactions	Search source	Interactive Consequence
Severity level		
Aspirin - Perindopril	Both	Aspirin reduces the effect of Perindopril
Clarithromycin - Clopidogrel	Both	Common use causes increased toxicity, the risk of impaired kidney function
Clarithromycin - Colchicin	Both	Clarithromycin raises blood levels of Colchicine to

		dangerous levels Increased serious side effects affecting blood cells, nervous system, liver, kidneys
Clarithromycin - Rosuvastatin	Medsca pe.com	Clarithromycin increases the toxicity of Rosuvastatin
Colchicin- Rosuvastatin	Both	Rosuvastatin increases colchicine toxicity in the blood. Causes muscle toxicity, multiple organ failure
Digoxin - Nebivolol	Both	Increases the risk of bradycardia
Omeprazol- Clopidogrel	Both	Omeprazole reduces the effect of Clopidogrel in preventing heart attacks and strokes
Prednisolone- Clarithromycin	Both	Clarithromycin increases blood levels of prednisone. Many side effects such as high blood sugar, depression
Average level		
Amlodipin - Metformin	Medsca pe.com	Amlodipine reduces the effect of Metformin. Patients should be closely monitored for glycemic control
Aspirin - Amlodipin	Drugs.c om	Aspirin reduces the antihypertensive effect of Amlodipine
Meloxicam - Amlodipin	Drugs.c om	Meloxicam reduces the anti- inflammatory effect
Meloxicam - Metformin	Drugs.c om	Amlodipine blood pressure
Meloxicam - Telmisartan	Both	Sharing can cause lactic acidosis
Meloxicam -	Both	Especially for

Nebivolol		patients with renal failure
Metformin - Hydrochlorothiazid	Drugs.c om	Meloxicam reduces the antihypertensive effect of Telmisartan
Aspirin - Prednisolone	Both	Meloxicam reduces the antihypertensive effect of Nebivolol
Aspirin - Telmisartan	Both	Hydrochlorothiazid increases blood sugar and reduces the effects of Metformin, which interferes with diabetes control.
Captopril - Metformin	Both	Concomitant use increases the risk of gastrointestinal bleeding
Ciprofloxacin - Omeprazol	Both	Aspirin reduces the effect
Ciprofloxacin - Prednisone	Both	Telmisartan antihypertensive. Decreased renal function in the elderly, increased serum potassium
Vitamin E - Clopidogrel	Drugs.c om	Blood glucose should be closely monitored in the elderly/in patients with renal impairment.
Pravastatin - Telmisartan	Medsca pe.com	Omeprazole reduces the effect of Ciprofloxacin by 20%
Prednisolone - Clopidogrel	Medsca pe.com	Shared use increases the risk of tendonitis, easy tendon rupture
Prednisolone - Amlodipin	Drugs.c om	Vitamin E increases the risk of abnormal bleeding or body bruising
Metronidazol - Rosuvastatin	Drugs.c om	Telmisartan increases pravastatin toxicity

Digoxin - Telmisartan	Both	Prednisolone reduces the effect of Clopidogrel
Prednisolone - Telmisartan	Drugs.c om	Prednisone reduces the effect
Telmisartan - Metoprolol	Medsca pe.com	Amlodipine lowers blood pressure. Possible interactions when used for more than 1 week cause water and sodium retention, leading to edema and sudden weight gain.
Telmisartan - Nebivolol	Medsca pe.com	Joint use increases the risk
Low level		
Amlodipine - Captopril	Dru gs.c om	Caution when using for 1-3 weeks or more, need to monitor blood pressure in the whole body
Aspirin - Omeprazol	Dru gs.c om	Omeprazole reduces the effect of aspirin
Prednisolone - Monterlukast	Me dsc ape. com	Prednisone reduces the effect
Prednisolone - Metformin	Bot h	Montelukast
Clarithromycin - Metronidazol	Bot h	Prednisone reduces the effect
Omeprazol - Tizanidine	Me dsc ape. com	Metformin

Comment: The drug interaction search results are according to Drug.com and Medscape.com and there are 35 drug interactions occurring during outpatient prescribing.

5. Discussion

400 outpatient prescriptions at a hospital or medical center in Ben Cat town have been investigated. The average quantity in a prescription is 3.45 drugs. The average

number of drugs according to the diagnosis stated in the prescription is 2.2 drugs.

The rate of prescriptions with interactions studied and looked up by Drug.com and medscape.com is 13.25% and 14%, respectively. There is a slight difference due to the difference in the sub-criteria between the two these two sources. There are 35 drug pairs that interact, in which there are 8 pairs of drugs with severe interaction, 21 pairs of drugs with moderate interaction, and 6 pairs of drugs with mild interactions.

6. Conclusion

400 outpatient prescriptions at a hospital or medical center in Ben Cat town have been investigated

Drug interactions are most common in people 40 years of age and older. Along with age, the incidence of multiple diseases is high, so patients use a number of drugs to treat the disease and the risk of drug interactions due to the use of many drugs also increases. In order to avoid drug interactions, prescribers should pay special attention when prescribing for elderly people having chronic diseases with prolonged use of the drug.

Although the level according to the two sources is different, the goal of this study is to identify pairs of common drug interactions in outpatient prescriptions so that they can be prevented or combined with appropriate drug use for effective treatment results

7. Recommendations

At Ben Cat Town Medical Center, there is no training plan on drug interaction software, so in the coming time, there should be a long-term and specific training plan on drug interactions for prescribing doctors, to supply well-qualified clinical pharmacist resources for the Faculty of Pharmacy. To facilitate the lookup of drug interactions, it is necessary to install additional software to look up drug information to the prescriber's computer. In which, training on drug information is the most important step to reduce the rate of prescription interactions.

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PHÂN TÍCH VỀ TƯƠNG TÁC THUỐC TRONG KÊ ĐƠN ĐIỀU TRỊ NGOẠI TRÚ TẠI TRUNG TÂM Y TẾ THỊ XÃ BẾN CÁT, TỈNH BÌNH DƯƠNG

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Tóm tắt: Thực trạng kê đơn thuốc điều trị ngoại trú và tương tác thuốc là yếu tố quan trọng trong việc điều trị hoặc tăng khả năng xuất hiện các phản ứng có hại (ADR). Tuy nhiên, tương tác thuốc là vấn đề thường gặp trong điều trị, đặc biệt trong trạng thái đa bệnh lý, đa triệu chứng cần phải phối hợp nhiều loại thuốc dùng đồng thời. Vì vậy, người bệnh càng có nguy cơ gặp nhiều tương tác thuốc. Qua khảo sát tương tác thuốc xảy ra trong quá trình kê đơn điều trị ngoại trú tại Trung tâm Y tế thị xã Bến Cát 6 tháng đầu năm 2022 và theo kết quả khảo sát 400 đơn thuốc về số lượng thuốc, số chuẩn đoán, tỷ lệ đơn thuốc có tương tác và các cặp thuốc có tương tác, tỷ lệ đơn thuốc có tương tác tra cứu Drug.com 13,25%; Tỷ lệ đơn thuốc có tương tác tra cứu medscape.com 14%. Có 35 cặp thuốc tương tác: 8 cặp thuốc tương tác mức độ nặng, 21 cặp thuốc tương tác mức độ trung bình, 6 cặp thuốc tương tác mức độ nhẹ. Vì vậy, cần có kế hoạch đào tạo về tương tác thuốc cho các bác sĩ kê đơn cũng như đầu tư hệ thống phần mềm tra cứu thông tin thuốc, trong đó tập huấn thông tin thuốc là khâu quan trọng nhất để giảm tỉ lệ tương tác thuốc kê đơn.

Từ khóa: Tương tác thuốc; Bệnh nhân ngoại trú; Thuốc theo đơn; Nhiều thuốc trong đơn; Phản ứng bất lợi (ADR)