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# Study of Potential Interactions with Oral Antidiabetic Drugs in Patients at the Outpatient Department of dr. M. Yasin Hospital, Bone Regency

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**Abstract**

*Diabetes Mellitus (DM) is a metabolic disorder characterized by an increase in blood glucose levels above the normal limit. One thing that can influence the effectiveness of treatment therapy for Diabetes Mellitus patients is the possibility of drug interactions. This research is a type of descriptive research which aims to determine the possibility of oral antidiabetic drug interactions in patients at the Outpatient Installation of Dr.M.Yasin Hospital, Bone Regency. Research data collection was carried out by taking secondary data from outpatient prescriptions at the Dr. The data used is that the patient's prescription is collected and then identified whether it meets the inclusion and exclusion criteria. If a prescription has been obtained that meets the criteria, the prescription is recorded. The next step is to assess the possibility of drug interactions based on the application and drug interaction guidebook. From the results of the study, it was concluded that there is a possibility of oral antidiabetic drug interactions occurring in patients at the Outpatient Installation at Dr.M.Yasin Hospital, Regency. Bone from December 2014 to August 2015 with a percentage of 55.3% of the 38 research sample prescription sheets.*

***Abstrak***

Diabetes Mellitus (DM) merupakan penyakit gangguan metabolik yang ditandai dengan meningkatnya kadar glukosa darah di atas batas normalnya. Salah satu yang dapat memengaruhi efektivitas terapi pengobatan pasien Diabetes Mellitus yaitu kemungkinan terjadinya interaksi obat. Penelitian ini merupakan jenis penelitian deskriptif yang bertujuan untuk mengetahui kemungkinan terjadinya interaksi obat antidiabetik oral pada pasien di Instalasi Rawat Jalan Rumah Sakit dr. M.Yasin Kabupaten Bone. Pengumpulan data penelitian dilakukan dengan mengambil data sekunder dari resep pasien rawat jalan di Instalasi Farmasi Rumah Sakit dr.M.Yasin Kabupaten Bone pada bulan Desember 2014 sampai Agustus 2015. Yang pengambilan sampelnya dilakukan dengan cara *purposive sampling* dengan mempertimbangkan kriteria inklusi dan ekslusi penelitian.Pengolahan data yang dilakukan yaitu resep pasien dikumpulkan kemudian dilakukan identifikasi apakah memenuhi kriteria inklusi dan ekslusi. Jika sudah diperoleh resep yang sesuai kriteria, dicatat resepnya langkah selanjutnya dilakukan pengkajiankemungkinan terjadinya interaksi obat berdasarkan aplikasi dan buku panduan interaksi obat.Dari hasil penelitian disimpulkan bahwaterdapat kemungkinan terjadinya interaksi obat antidiabetik oral pada pasien di Instalasi Rawat Jalan Rumah Sakit dr.M.Yasin Kabupaten Bonepada bulan Desember 2014 sampai Agustus 2015 dengan persentase sebesar 55,3 % dari 38 lembar resep sampel penelitian.

**Kata Kunci** : Interaksi Obat, Antidiabetik Oral

## INTRODUCTION

Diabetes Mellitus (DM) is a health problem that has an impact on productivity and can reduce the quality of human resources whose prevalence will continue to increase from year to year (Elvina R, 2012). The prevalence of Diabetes Mellitus (DM) increased from 2007, namely around 1.1%, to 2013, namely around 2.1% (Riskesdas, 2013). Patients with Diabetes Mellitus (DM) usually also have comorbidities so they require various types of medication. One of the things that needs to be considered when using oral antidiabetic drugs is the possibility of drug interactions when given with other drugs.

Drug interactions are one of eight categories of drug-related problems or better known as DRP (Drug Related Problem) which can affect patient clinical outcomes (Utami MG, 2013).

There are several studies related to drug interactions, one of which is the results of Deby Gus Juliasemi's research regarding antidiabetic drug interactions in the Inpatient Installation of PKU Muhammadiyah Hospital Yogyakarta in 2011 which found 3 incidents of pharmacokinetic interactions (2.3%) and 44 incidents of unknown interactions ( 33.9%) of a total of 47 drug interactions (36.2%) (Juliasemi DG, 2011). Several study reports also state that the proportion of drug interactions with other drugs (between drugs) ranges from 2.2% to 30% occurring in inpatients and 9.2% to 70.3% occurring in outpatients (Gitawati R , 2008).

In this regard, it is important to carry out research regarding the assessment of the possibility of interactions with oral anti-diabetic drugs in patients at the Dr. Hospital Outpatient Unit. M. Yasin, Bone Regency.

**METHODS**

This type of research is descriptive through a retrospective study, by collecting data from outpatient prescriptions who receive oral antidiabetic drugs. The research was conducted at the Pharmacy Installation of the Dr.M.Yasin Hospital, Bone Regency in August 2015. The population in this study were all patient prescriptions at the Outpatient Installation of the Dr.M.Yasin Hospital, Bone Regency. The sample in this study was patient prescriptions at the Outpatient Installation of Dr. receiving drugs other than oral antidiabetic drugs. Meanwhile, the exclusion criteria were prescriptions for patients who received oral antidiabetic drugs only.

Research data was collected by taking secondary data from patient prescriptions at the Dr. Data processing carried out was patient prescriptions written by doctors in the outpatient department of Dr.M.Yasin Hospital, Bone Regency from December 2014 to August 2015, collected and then identified whether they met the inclusion and exclusion criteria. If a prescription has been obtained that meets the criteria, the drugs are recorded. The next step is to identify potential drug interactions based on the application and drug interaction guidebook. Potential interactions are categorized according to the level of significance of drug interactions and the percentage of potential drug interactions for each category of potential interaction significance is calculated, displayed in tabular form. The research instruments used were recipes and applications as well as drug interaction guidebooks.

**RESULTS AND DISCUSSION**

Based on data taken from outpatient prescriptions from Dr. M. Yasin, Bone Regency, from December 2022 to August 2023, the results showed that the number of prescriptions receiving oral anti-diabetics and in accordance with the inclusion and exclusion criteria for the research sample was 38. This research was conducted in August at the Hospital Pharmacy Installation. An overview of the possible occurrence of oral antidiabetic drug interactions as a whole based on the literature review is shown in Table 1, Table 2 and Table 3.

Table 1 Distribution of data on oral antidiabetic drugs that may interact with other drugs

| No | Name of Interacting Drug | Drug Interactions That Occur Based on Literature Review (Drugs Interaction Facts) | (%) |
|---|---|---|---|
| 1 | Metformin-Ranitidin | Ranitidine will increase the levels or effects of metformin by reducing renal clearance. | 9,09 |
| 2 | Metformin-Metilprednisolon | Methyllprednisolone decreases the effects of metformin by pharmacodynamic antagonism. | 4,54 |

| | | | |
|---|---|---|---|
| 3 | Metformin-Isoniazid | Isoniazid reduces the effects of metformin by an unknown interaction mechanism. | 18,2 |
| 4 | Metformin-Vitamin $B_{12}$ | Metformin decreases vitamin B12 levels by an undetermined interaction mechanism. | 27,27 |
| 5 | Metformin-Cefadroxil | The increased effect of metformin is due to reduced metformin secretion by the presence of cefadroxil. | 18,2 |
| 6 | Metformin-Captopril | Increases insulin sensitivity by ACE inhibitors so that the risk of hypoglycemia increases. | 9,09 |
| 7 | Metformin-Cotrimoxazole | Cotrimoxazole will increase the levels or effects of metformin by basic (cationic) drug competition for renal tubular action. | 4,54 |
| 8 | Glibenklamid-Ranitidin | Ranitidine will increase the levels or effects of glibenclamide by increasing gastric pH. | 4,54 |
| 9 | Glibenklamid-Meloxicam | Meloxicam increases the effects of glibenclamide by an unknown mechanism. Risk of hypoglycemia. | 4,54 |

(Source: Secondary Data, 2023)

Table 2 Percentage of Possible Interactions with Oral Antidiabetic Drugs in Patients in the Outpatient Department of Dr. M. Yasin, Bone Regency based on the number of interactions

| **Interaction Events** | **Number of Recipes** | **(%)** |
|---|---|---|
| Interact | 21 | 55,3 |
| Not Interacting | 17 | 44,7 |
| Amount | 38 | 100 |

(Source: Secondary Data, 2023)

Table 3 Percentage of Possible Drug Interaction Events in Patients in the Outpatient Installation of Dr.M.Yasin Hospital, Bone Regency according to the Type of Interaction based on the Number of Cases

| **Type of Interaction** | **Number of Cases** | **(%)** |
|---|---|---|
| Pharmacokinetics | 8 | 36,4 |
| Pharmacodynamics | 3 | 13,6 |
| Unknown | 11 | 50 |

| | | |
|---|---|---|
| Amount | 22 | 100 |

(Source: Secondary Data, 2023)

Table 2 explains that there are 21 prescriptions for oral antidiabetic drugs that are likely to interact with other drugs out of 38 patient prescriptions that meet the inclusion and exclusion criteria for the research sample, namely a percentage of 55.3%. Meanwhile, Table 3 shows that of the 21 prescriptions that had the possibility of interacting, there were a total of 22 cases of drug interactions, consisting of 36.4% of drugs that interacted pharmacokinetically, 13.6% pharmacodynamically and 50% whose interaction mechanisms were unknown.

By knowing the types of drug interactions that are likely to occur, pharmacists can determine whether a type of drug interaction can be handled by themselves, or whether it requires discussion with a doctor. So that the pharmacist can determine what solution can be given when it is discovered that there is a possibility that the medication being prescribed could cause a drug interaction, such as changing one of the drugs or providing a distance or time interval for consumption of the drug.

## CONCLUSIONS

Based on the results of research and discussion according to the literature review and application of drug interactions Drugs Interaction Facts, it can be concluded that there is a possibility of drug interactions occurring in patients at the Outpatient Installation of Dr.M.Yasin Hospital, Bone Regency. The potential possibility of oral antidiabetic drug interactions from December 2014 to August 2015 was 55.3% of the 38 prescriptions that met the inclusion and exclusion criteria for the research sample. And the most frequently prescribed oral antidiabetic drug is metformin.

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