Quest Journals
Journal of Research in Pharmaceutical Science
Volume 10 ~ Issue 6 (2024) pp: 35-39
ISSN(Online) : 2347-2995
www.questjournals.org

Research Paper

Evaluating Medication Use in Pregnant Patients at the Obstetrics and Gynecology Polyclinic Dr. M. Djamil Hospital, Padang

Dian Ayu Juwita*, Dedy Almasdy, Hansen Nasif, Firstia Virginellisa,
Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Andalas, Padang, West Sumatera. 25163, Indonesia
**Corresponding Author*

ABSTRACT: *The use of medications during pregnancy carries the risk of causing fetal abnormalities because most drugs can cross the placenta. Therefore, special attention is needed when administering medications to pregnant women to avoid potential harm to the fetus. This study aims to identify inaccuracies in indications, patients, medications, and dosages, as well as potential drug interactions that may occur. Data were collected through purposive sampling from patient medical records at the Obstetrics and Gynecology Polyclinic of Dr. M. Djamil Hospital, Padang. Out of 119 pregnant patients, 44 received medications that were then analyzed descriptively. The study found 5 cases Inappropriate of indications (11.36%), 3 cases Inappropriate of patients (6.81%), 1 case Inappropriate of dosage (2.27%), no cases Inappropriate of medication (0%), and 21 potential drug interactions (47.72%).*

KEYWORDS: *Medication use, pregnant, Inappropriate of indications, Inappropriate of dosage, Inappropriate of patients*

***R**eceived 12 June, 2024; **R**evised 22 June, 2024; **A**ccepted 24 June, 2024 © The author(s) 2024.*
P**ublished with open access at **www.questjournals.org

I. INTRODUCTION

Pregnancy is the process of fetal growth and development in the womb, starting from conception until the onset of labor. A normal pregnancy lasts about 280 days or approximately 40 weeks. During this period, the mother's health is crucial for the baby's development. Medication use in pregnant women must be done carefully, selecting the safest drugs at the lowest effective dose and shortest duration, as most drugs can cross the placenta and pose a risk of birth defects [1] and [2].

The health of pregnant women is one of the main priorities in improving the overall quality of public health. Pregnant women require special attention because pregnancy is a physiological condition that demands close monitoring, including in the use of medications. The use of medications in obstetric and gynecological clinics is crucial as the drugs consumed not only affect the health of the mother but also the development of the fetus. Medical issues can develop during pregnancy, with about 15% of pregnant women experiencing complications. Before realizing their pregnancy, women are often exposed to environmental chemicals, over-the-counter (OTC) drugs, and prescription medications. Many pregnant women require medication for conditions such as muscle pain, digestive problems, flu, infections, and additional supplements [3] and [4].

Medication use during the first trimester is highly risky for the fetus and should be avoided if possible, as this is a critical period for the development of major organs. In the second and third trimesters, medications can affect fetal function or cause toxic effects. Notable cases of teratogenic effects include thalidomide and diethylstilbestrol (DES), which led to birth defects and cancer in children exposed in utero.Research indicates that dosing errors often occur in pregnant women. For example, a drug that is safe at a certain dose (category A) can become dangerous (category C) if the dose is incorrect. A study found 2% incorrect indications, 8% incorrect medications, 1% incorrect patients, 36% incorrect dosages, and 4% potential drug interactions [5] and [6].

Research on the use of medications in pregnant women at Dr. M. Djamil Hospital Padang is necessary due to the complexity of medical conditions often experienced by pregnant women. The selection of

medications for pregnant women must be done with extreme caution to avoid teratogenic effects and other complications that may endanger the fetus. Therefore, it is important to study the patterns of medication use among pregnant women in this clinic to ensure that the therapy provided is safe and adheres to clinical guidelines. Given the importance of this issue, a study was conducted to examine medication use in pregnant women at the Obstetrics and Gynecology Polyclinic of Dr. M. Djamil Hospital, Padang, focusing on incorrect indications, patients, medications, dosages, and potential drug interactions.

II. RESEARCH METHODS

The research method used in this study is a retrospective method. Sample collection was conducted using the consecutive sampling technique, where all available samples that met the research criteria were included in the study until the required number was reached. Data were collected from the medical records of pregnant patients at the Obstetrics and Gynecology Polyclinic of Dr. M. Djamil Hospital Padang who met the inclusion criteria, namely outpatient pregnant patients at the polyclinic with complete and clear medical records. The collected data included patient identity, doctor diagnosis, drug name, dosage, method of administration, duration of administration, and frequency of drug administration. The obtained data were then transferred to the research data collection sheet.

These data were then analyzed descriptively and compared with the literature and drug use standards to identify any inaccuracies in drug use. These inaccuracies included incorrect indications, incorrect drugs, incorrect dosages, and incorrect patients. Additionally, an analysis was conducted on the potential for drug interactions. The research results are presented in the form of tables and diagrams.

III. RESULTS AND DISCUSSION

The research findings indicate that out of 119 pregnant patients, only 44 patients (36.97%) received prescriptions from doctors. Meanwhile, the remaining 75 pregnant patients (63.03%) underwent regular prenatal check-ups and received guidance from doctors regarding their pregnancy conditions and health. Most patients who received treatment were only given supplements and multivitamins to support their pregnancies due to the absence of serious complaints or diagnoses. Among the 44 patients prescribed medication, 29 received vitamin and mineral supplements, 3 received medication only, and 12 other patients received a combination of vitamin and mineral supplements along with other drugs. Medications administered to pregnant patients included anti-hyperthyroid, anti-emetic, antipyretic, analgesic, cough medication, antihypertensive, and gastrointestinal drugs.

The most widely accepted supplements and multivitamins among pregnant women in this study were ferrous sulfate (SF), provided to 27 patients. Each tablet of ferrous sulfate contains 300 mg of heptahydrate iron sulfate. The iron requirement during pregnancy is approximately 27-30 mg/day. Dietary iron content often fails to meet the iron needs during pregnancy. Iron deficiency can lead to anemia in pregnant women and reduced blood flow to the fetus, potentially resulting in fetal nutrient deficiency. Therefore, supplementing iron is crucial to meet the iron requirements during pregnancy [7] and [8]

In addition to ferrous sulfate, calcium and folic acid were also commonly prescribed in this study. The calcium requirement during pregnancy is 900 mg/day (Becker, 2004). This requirement increases by 122-167% during pregnancy compared to non-pregnant or non-lactating women, especially for fetal bone development. Low calcium concentrations have been associated with hypertension during pregnancy, although definitive evidence is still lacking. The number of study samples receiving folic acid was 25 pregnant patients. Each folic acid tablet contains 1 mg of the substance. The prescribed usage of folic acid for patients was 1-2 tablets per day. Other studies indicate that daily folic acid supplementation during pregnancy can reduce the risk of neural tube defects and other unfavorable pregnancy outcomes such as low birth weight [8] and [9]. Therefore, a dose of 400 µg/day of folic acid supplement is recommended for pregnancy.

Table 1. Inappropriate in Drug Use Among Pregnant Women (n=44)

Form of Inappropriate	Number of Patients	Percentage (%)
Inappropriate of indications	5	11.36
inappropriate of patient	3	6.81
inappropriate of dosage	1	2.27
inappropriate of Medication	-	0
Potential Drug Interactions	21	47.72

The inappropriate indications observed among pregnant patients at the Obstetrics and Gynecology Polyclinic of Dr. M. Djamil Hospital Padang occurred in 5 patients (11.36%) (table 1), involving the administration of paracetamol, antacids, mefenamic acid, and amoxicillin. The use of paracetamol 500 mg twice daily in one patient was deemed inappropriate as the patient only complained of a recent cold and cough without fever, pain, or headache. Paracetamol is considered safe during pregnancy and is the preferred choice as an

analgesic-antipyretic due to its lack of congenital abnormalities in fetuses. However, caution must still be exercised in its use among pregnant women, ensuring that the therapeutic benefits outweigh any potential risks [10] and [11].

Inappropriate use of amoxicillin antibiotics was identified in two patients. These antibiotics were prescribed to patients complaining of lower abdominal pain and back pain, conditions that did not warrant amoxicillin use as it is indicated for infections caused by gram-negative and gram-positive bacteria. Lower back and abdominal pain in these patients may have been due to uterine contractions in the late trimester of pregnancy. Amoxicillin is categorized as class B for pregnant women due to the absence of fetal abnormalities. However, other studies have associated its use during pregnancy with an average lower birth weight of approximately 3.4 kg, 5% premature births, 4% congenital abnormalities, and antibiotic resistance. The primary concern in antibiotic use lies not in dosage determination, duration of use, or antibiotic type, but in the fundamental question of whether antibiotics are indicated at all. Resistance is defined as the inability to inhibit bacterial growth with systemic antibiotic administration at normal therapeutic doses or minimal inhibitory concentrations [12] and [13].

Another instance of inappropriate indication involved the use of mefenamic acid, where a patient presented with vaginal bleeding three days prior to examination, which had ceased by the time of her prenatal visit. Based on the doctor's diagnosis, the patient was experiencing threatened miscarriage. Management for threatened miscarriage typically involves bed rest to enhance uterine blood flow and reduce mechanical stimulation. Mefenamic acid is a nonsteroidal anti-inflammatory drug (NSAID) used for pain and inflammation. NSAID use during the late trimester of pregnancy has been associated with a significant potential for spontaneous abortion, up to 7.5%. Mefenamic acid may cause various side effects including gastric discomfort, stomach pain, diarrhea, constipation, bloating, dry mouth, dizziness, itching, and skin rash. Its use during pregnancy is not recommended and it falls under category C for pregnancy medications. When needed to alleviate pain or headaches during pregnancy, paracetamol is considered safer compared to mefenamic acid, as exposure to paracetamol has not been associated with fetal abnormalities [14] and [15]

In this study, inappropriate use of antacids was identified in one patient (table 1). Antacids are typically used to alleviate pain from peptic ulcers, esophageal reflux, gastric acid disturbances, heartburn, dyspepsia, for prevention of stress ulcers and GI bleeding, to reduce gastric-related risks, and manage hyperphosphatemia. However, the patient only complained of decreased appetite. Inappropriate use of antacids in pregnant women can affect the absorption of iron from both food and mineral supplements. Low stomach acid or the use of alkaline medications like antacids inhibits iron absorption [2] and [5].

Antacids are classified as category B drugs for pregnant women, but compounds like Al(OH)3 are category C and Mg(OH)2 is category B during pregnancy. Aluminum compounds in antacids can cause constipation and delay gastric emptying, hence they are generally not recommended during pregnancy or lactation. Magnesium compounds are poorly soluble in water and react slowly with gastric hydrochloric acid to form magnesium chloride, which is insoluble. Magnesium trisilicate also forms silica colloids that adsorb pepsin and have a longer duration of action. Often, antacid preparations combine these effects: the constipating effect of aluminum is balanced by the rapid symptom relief of magnesium, while the effects of aluminum are slower and longer-lasting [16].

In this study, another instance of inappropriate categorization occurred in one patient who was prescribed diethylstilbestrol (DES) during the second trimester of pregnancy (table 1). DES is a nonsteroidal estrogen derivative of Alilestrenol used to manage threatened miscarriage due to its strong gestagenic and specific properties. Pregnant women exposed to DES may face an increased risk of adenocarcinoma in the cervix and vagina. The use of estrogen, progesterone, or their combination is highly contraindicated during pregnancy due to proven risks of fetal damage. Women exposed to diethylstilbestrol during pregnancy have a slightly increased risk of breast cancer. Although most women exposed to DES in utero have normal pregnancies, there is evidence of increased risk of spontaneous abortion in the first and second trimesters, ectopic pregnancies, and premature births. Animal studies on DES indicate that it crosses the placenta and enters fetal circulation, accumulating in fetal reproductive tract tissues. DES can affect the chromosomes of cells and cause abnormalities [17] and [18].

In this study, dosing inaccuracies included both overdosing and underdosing. One patient received an inadequate dose, where a diagnosis of vulvovaginal candidiasis led to the prescription of vaginal nystatin tablets at 100,000 units once daily. However, according to literature, nystatin vaginal tablets for vulvovaginal candidiasis are typically prescribed at doses ranging from 500,000 to 1 million units three times daily. The study results indicated that the prescribed nystatin dose was lower than recommended. Underdosing means the drug does not reach the Minimum Effective Concentration (MEC), thereby failing to produce therapeutic effects. This can occur due to doses being too low for the desired effect, excessively long dosing intervals, drug interactions reducing bioavailability, or too short duration of drug action [19].

From the study findings, medication dosing inaccuracies were not found in the use of drugs among all pregnant patients receiving prescriptions at the obstetrics and gynecology clinic (0%). Inappropriate drug selection refers to choosing a drug that is not proven to be the most beneficial, safe, appropriate, or economical. Inappropriate drug selection can result in ineffective treatment, drug toxicity or side effects, and increased treatment costs. The success and effectiveness of drug therapy depend on identifying and diagnosing the patient's medical problem accurately [20]

The potential drug interactions encountered in this study were pharmacokinetic interactions, where the absorption of iron supplements was affected by several drugs. Drug interactions occurred in 21 patients (table 1): interactions between ferrous sulfate and calcium occurred in 20 patients, and interaction between ferrous sulfate and antacids occurred in 1 patient. Ferrous sulfate is an iron compound in salt form conjugated with sulfate, which allows for iron salt absorption three times faster than ferric form. Ferrous sulfate is used as an iron source for iron deficiency anemia, with each ferrous sulfate tablet containing 60-65 mg of iron. Iron absorption is influenced by other products such as calcium (most abundant in milk and dairy products), polyphenols in tea, coffee, and some grapes and cereal products, which reduce iron absorption. The use of ferrous sulfate tablets was often combined with Calc, containing 25 IU Vitamin D and oyster shell providing 500 mg of calcium [21] and [22]

Antacid use also reduces iron (Fe) absorption in the stomach. Gastric acidity levels increase iron solubility. Low stomach acid or the use of alkaline medications like antacids hinder iron absorption. Under optimal conditions, only about 30% of iron is absorbed. Therefore, it is advisable to administer these medications with an interval of approximately 2-3 hours. Another interaction affecting iron absorption is Vitamin C, which can enhance iron absorption; doses ≥ 200 mg increase Fe absorption by ≥ 30%. The average daily requirement of Vitamin C for pregnant women according to literature is 85 mg/day, with dosages ranging from 25 – 500 mg/day [21] and [23].

IV. CONCLUSION

From the research conducted, it can be concluded that Inappropriate of indications were found 11.36%, Inappropriate of dosage were 2.27%, Inappropriate of patient were 2.27%, and potential drug interactions were 47.72%.

REFERENCES

[1]. Yulianti, Tri, Dahlia Nugrahini, EM Sutrisna. 2009. Drug Use Evaluation On Pregnant Woman At X Hospital Surakarta. Pharmacon. 10:1

[2]. Samadi AR, Mayberry RM, Zaidi AA, Pleasant JC, McGhee N Jr, Rice RJ. 1996. Maternal hypertension and associated pregnancy complications among AfricanAm and other women in the United States. Obstet Gynecol. 87:557–563

[3]. Prest, M., Tan, C.K. 2003. Penggunaan Obat pada Masa Kehamilan dan Menyusui. Jakarta : PT Elex Media Komputindo

[4]. Bandiyah, Siti. 2009. Kehamilan, Persalinan, dan Gangguan Kehamilan. Yogyakarta : Nuha Medika

[5]. Dawes, Matthew., Philip J.C. 2001. Pharmacokinetics in Pregnancy. Best Practice and Research Clinical Obstetrics and Gynaecology.15.6: 819-826

[6]. Dipiro, J.T., Robert L.T., Gary C.Y., Gary R.M., Barbara G.W., L.Michael P. 2005. Pharmacotherapy: A Pathophysiologic Approach, Sixth Edition. New york : The McGraw-Hill Companies

[7]. Gawde, S.R., S.S Bhide., T.C Patel., A.R Chauhan., N.M Mayadeo., S.B Sawardekar. 2013. Drug Prescription Pattern in Pregnant Women Attending Antenatal Out Patient Department of a Tertiary Care Hospital. British Journal of Pharmaceutical Research.3.1:1-12

[8]. Ladipo, Oladapo A. 2000. Nutrition in pregnancy: mineral and vitamin supplements. American Journal Clinical Nutrition. 72 : 28–90

[9]. Hoyo, Cathrine., Amy P Murtha., Joellen M Schildkraut., Michele R Forman., Brian Calingaert., Wahnefried., Joanne Kurtzber., Randy L Jirtle., Susan K Murphy. 2011. Folic acid supplementation before and during pregnancy in the Newborn Epigenetics Study (NEST). BMC Public Health.11:46

[10]. Joshi, Harsh. 2012. Drug Use Pattern During Pregnancy: A Prospective Study At Tertiary Care Teaching Hospital. NHL Journal of Medical Sciences.1:1

[11]. Shaikh, A.K, Madhuri D.K. 2013. Drug in pregnancy and lactation. International Journal of Basic and Clinical Pharmacology, Review Artikel 10.54-55

[12]. Jepsen, Peter., Mette V. Skriver., Andrea Floyd., Loren Lipworth., Henrik C. Schønheyder ., Henrik T. Sørensen. 2003. A population-based study of maternal use of amoxicillin and pregnancy outcome in Denmark. J Clin Pharmacol, 55: 216–221

[13]. Costantine, Maged M. 2014. Physiologic and pharmacokinetic changes in pregnancy. Frontiers in Pharmacology, Review Article. published: 03 April 2014

[14]. Marcus, D, Bain P.A. 2009. Effective Migrain Treatment in Pregnant and Lactating Women : A Practical Guide. Humana Press

[15]. Nakhai, Hamid Reza., Perrine Broy., Odile Sheehy., Anick Bérard. 2011. Use of nonaspirin nonsteroidal anti-inflammatory drugs during pregnancy and the risk of spontaneous abortion. CMAJ

[16]. European Food Safety Authority. 2013. Scientific Opinion on Dietary Reference Values for vitamin C. EFSA Journal. 11(11):3418

[17]. Palmer, Julie R., Elizabeth E. Hatch., R. Sowmya Rao., Raymond H. Kaufman., Arthur L. Herbst., Kenneth L. Noller., Linda Titus-Ernstoff., dan Robert N. Hoover.2001. Infertility among Women Exposed Prenatally to Diethylstilbestrol. American Journal of Epidemiology. . 154: 4
[18]. Kennedy, Debra. 2014. Classifying Drugs In Pregnancy. Australian Prescribing. 37 : 2. 37:3 8–40
[19]. Soong, Derrick., Adrienne Einarson. 2009. Vaginal yeast infections during pregnancy. Canadian Family Physician. 55: 03
[20]. World Health Organization. 2002. Promoting Rational Use Of Medicine. Geneva: Core Components.
[21]. Slamberova, R. 2012. Drugs In Pregnancy: The Effects On Mother And Her Progeny. Physiol. 61:1: 123-135
[22]. Well, B.G., Joseph T. Dipiro., Terry L.S., Cecily V.D. 2009. Pharmacotherapy Handbook Seventh edition. New York : Mc Graw Hill Companies
[23]. Sweetman, Sean C. 2009. Martindale ed 36 : The Complete Drug Reference. London : Pharmaceutical Press