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University of AL_ Qadisiyah
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The role of the community pharmacist in providing instructions needed to patient taking oral antidiabetic drugs

A Graduation research submitted to College of Pharmacy,
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in Partial Fulfillment of the Requirements for The Degree of
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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

(اِقْرَأْ وَرَبُّكَ الْأَكْرَمُ الَّذِي
عَلَّمَ بِالْقَلَمِ عَلَّمَ الْإِنْسَانَ مَا لَمْ
يَعْلَمْ)

صِدْقَ اللَّهِ الْعَظِيمِ

سورة العلق - الآية (٣-٥)

Supervisor Certificate

I certify that this project

“The role of the community pharmacist in providing instructions needed to patient taking oral antidiabetic drug

was prepared under my supervision at the College of Pharmacy, Al-Qadisiyah University as a graduation research

Dr. Safaa Ganduh

signature

Date: (/ / 2018)

Dedication

To my lovely father,

My great mother,

my family and professors,

**and to all who quench homeland with their
blood to make us live peacefully.**

Haneen laftah hakim

asseel nasser hashoosh

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Abstract

The objective behind this research is to determine the role of community pharmacist in providing the instructions needed to patient taking oral antidiabetic drugs. It included Participants as samples of community pharmacists in Al-Diwaniyah teaching hospital and diabetic .patients who had been admitted to the hospital

The Main outcome measure was to explore the extent to which the community pharmacist has a significant role in giving needed information .to a patient taking oral antidiabetic drugs

Where the results showed a prominent role played by the community pharmacist in giving important information needed by diabetic patient, i whether peaceful way to eat or alert to everything related to him, which is .in the best interest of the patient at the end

Through a variety of interventions and monitoring, it was concluded that community pharmacists can make a significant and effective contribution ., to the care of diabetic patient

However, the success of these interventions depends on building effective communication channels with the various health care professionals involved in the diabetic team

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Chapter One
Introduction
and
Literatures Review

1.General Role of pharmacists in diabetes management:

Because of the rapid expansion of available therapeutic agents to treat diabetes, the pharmacist's role in caring for diabetic patients has expanded. The pharmacist can educate the patients about the proper use of medication, screening for drug interactions, explain monitoring devices, and make recommendations for ancillary products and services. The pharmacist, although not the health care professional to diagnose diabetes, is important in helping the patient maintain control of their disease. The pharmacist can monitor the patient's blood glucose levels and keep a track of it. During their contact, the patients can ask the pharmacist any questions they did not ask the physicians and can get further information regarding diabetes. The pharmacist can also counsel the patients regarding insulin administration regularly so that the onset of complications can be postponed by having tight glycemic control. Another important role of pharmacist is always being available to answer the questions of the patients. Overall, it is the pharmacist's role to help a diabetic patient in the best possible way to cope with their disease.

2.1-Sulphonylureas (Glibenclamide, Gliclazide, Glimepiride)

Sulphonylureas enhance the pancreatic insulin secretion. They partially block ATP-sensitive K⁺ channels in beta cells causing cell membrane depolarization thus opening voltage dependent Ca⁺⁺ channels, increasing intracellular Ca⁺⁺ and thus triggering insulin secretion. As a result of increased plasma insulin concentration weight gain and hypoglycemia are common side

Effects.

2.1.1-Glibenclamide :

Side effect : severe hypoglycemia Weight gain is common. Gastrointestinal symptoms (nausea, vomiting, dyspepsia) and skin rashes are rare. The FDA insists that sulphonylureas may increase cardiovascular risks. most likely due to the mild diuretic effect, enuresis has been reported.

Interactions : Sulfonamides, beta-blockers, non-steroidal anti-inflammatory agents, etc. hardly increase the risk of hypoglycemia of glibenclamide

Contraindication : Diabetic emergencies (ketoacidosis, hyperosmolar coma). Advanced hepatic or renal insufficiencies; pregnancy and nursing period.

Our Comment:

Considering the marginal advantages and the likelihood of a slightly increased risk of hypoglycemia compared to other sulphonylureas antidiabetic drugs (e.g. glipizide), it is a difficult task to rationally justify the popularity of glibenclamide

The physicians' inclination towards antidiabetics that do not have a clearly established use is certainly related to the fact that a diabetes diet causes great problems in many people.

2.1.2-Gliclazide:**Common side effects:**

- stomach ache
- feeling sick
- vomiting
- indigestion
- diarrhea
- constipation

DRUG INTERACTIONS:

antidepressants, aspirin, propranolol, rifampin, phenylbutazone, disopyramide, probenecid, clofibrate, water pills, steroids, oral contraceptives, cimetidine.

Contraidication

liver problems, kidney problems, any allergies -pregnancy.

2.1.3-Glimepiride:**SIDE EFFECTS:**

- Hypoglycemia
- Hemolytic anemia
- hypoglycemia, dizziness, asthenia, headache, and nausea.

Drug intraction:

1- Alcohol/Food Interactions

2- Disease Interaction

There are 5 disease interactions with Amaryl (glimepiride) which include:

- Cardiovascular Risk
- Renal/Liver Disease
- G6Pd Deficiency
- Hyponatremia

Contraindication :

The following conditions are contraindicated with this drug. Check with your physician if you have any of the following

Conditions:

- low blood sugar
- G6PD Deficiency Anemia
- pituitary hormone deficiency •Hepatic Porphyria
- Addison's Disease • Hemolytic Anemia

2.2Biguanides(metformin):

Metformin's mechanisms of action differ from other classes of oral antihyperglycemic agents. Metformin decreases blood glucose levels by decreasing hepatic glucose production, decreasing intestinal absorption of glucose, and improving insulin sensitivity by increasing peripheral glucose uptake and utilization.

Increased peripheral utilization of glucose may be due to improved insulin binding to insulin receptors. Metformin administration also increases AMPK activity in skeletal muscle. AMPK is known to cause GLUT4 deployment to the plasma membrane, resulting in .

WARNINGS:

Rarely, too much metformin can build up in the body and cause a serious (sometimes fatal) condition called lactic acidosis. Lactic acidosis is more likely to happen in certain medical conditions such as kidney or liver disease, recent surgery, a serious infection, worsening heart failure, heavy alcohol use, a severe loss of body fluids (dehydration), or X-ray or scanning procedures that use iodinated contrast. Tell your doctor right away if any of these conditions occur or if

you notice a big change in your overall health. You may need to stop taking this medication for a short time. Older adults are also at higher risk. (See also Side Effects and Precautions sections.)

Stop taking this medication and get medical help right away if you have any symptoms of lactic acidosis, such as unusual tiredness, dizziness, severe drowsiness, chills, blue/cold skin, muscle pain, fast/difficult breathing, slow/irregular heartbeat, stomach pain with nausea, vomiting, or diarrhea.

Scottish Medicines Consortium (SMC) Decisions :

The Scottish Medicines Consortium has advised (September 2009) that Glucophage ® SR is accepted for restricted use within NHS Scotland for the treatment of type 2 diabetes mellitus in adult patients who are intolerant of standard release metformin, and in whom the prolonged-release tablet allows the use of a dose of metformin not previously tolerated, or in patients for whom a once daily preparation offers a clinically significant benefit

side effect:

- muscle pain or weakness
- numb or cold feeling in your arms and legs;
- trouble breathing;
- feeling dizzy, light-headed, tired, or very weak;
- stomach pain, nausea with vomiting; or
- slow or uneven heart rate.

Common metformin side effects may include:

- low blood sugar;
- nausea, upset stomach; or
- diarrhea.

Contraindication:

- severe kidney disease; or
- metabolic or diabetic ketoacidosis
- heart disease, congestive heart failure;
- liver disease

Common medications checked in combination with metformin:

- Aspir 81 (aspirin)
- Aspirin Low Strength (aspirin)
- Fish Oil (omega-3 polyunsaturated fatty acids)
- glipizide
- ibuprofen
- insulin
- Lasix (furosemide)
- Lipitor (atorvastatin)
- lisinopril
- Metoprolol Succinate ER (metoprolol)
- Metoprolol Tartrate (metoprolol)
- (esomeprazole)
- Plavix (clopidogrel)
- Vitamin B12 (cyanocobalamin)
- Vitamin C (ascorbic acid)
- Vitamin D3 (cholecalciferol)
- Vitamins (multivitamin)

2.3-Dipeptidylpeptidase-4-inhibitors: (sitagliptin,saxagliptin, vildagliptin)

DPP-4 inhibitors are a class of compounds that work by affecting the action of natural hormones in the body called incretins. Incretins decrease blood sugar by increasing consumption of sugar by the body, mainly through increasing insulin production in the pancreas, and by reducing production of sugar by the liver.

2.3.1-Saxagliptine:

Common side effects of ONGLYZA include:
upper respiratory tract infection,urinary tract infection,headache.

Drug Interactions:

Strong Inhibitors Of CYP3A4/5 Enzymes

Ketoconazole significantly increased saxagliptin exposure. Similar significant increases in plasma concentrations of saxagliptin are anticipated with other strong CYP3A4/5 inhibitors (e.g., atazanavir, clarithromycin, indinavir, itraconazole, nefazodone, nelfinavir, ritonavir, saquinavir, and telithromycin)

2.3.2-Sitagliptin**Side effect:**

upper respiratory tract infection and
headache; abdominal pain, nausea and diarrhea.

Drug intraction:

Sitagliptin may slightly increase the concentration of digoxin (Lanoxin) in the body. The occurrence of low blood glucose increases when sitagliptin is combined with a sulfonylurea (for example, glyburide [Micronase, Diabeta, Glynase, Prestab]) or insulin.

Contraindication :

- low blood sugar.
- Acute Inflammation of the Pancreas.
- Chronic Inflammation of the Pancreas.
- moderate to severe kidney impairment.
- Allergies.

2.3.3-Vildagliptin

Side effect:

- Nausea.
- Skin eruption.
- Headache, dizziness, tremor of hands,
- Generalized weakness.
- Fluid retention and swelling of legs and ankle.
- Constipation.
- Joint pain.

Drug intraction:

Abacavir; Alprazolam; Aminophylline; Amitriptyline; Amoxapine; Aripiprazole.

Contraindication:

- Diabetic ketoacidosis
- During of pregnancy
- During breastfeeding
- Individuals with impaired liver function
- Allergy to vildagliptin or any other ingredients of the pill
- In case of heart failure, moderate to severe
- In case of children.

The dose of ONGLYZA

should be limited to 2.5 mg when co-administered with a strong CYP3A4/5 inhibitor [see DOSAGE AND ADMINISTRATION and CLINICAL PHARMACOLOGY]

contraindicated in patients with a history of a serious hypersensitivity reaction to ONGLYZA, such as anaphylaxis, angioedema, or exfoliative skin condition.

2.4-Thiozolidiones (pioglitazone):

(TZDs), also termed “glitazones”, are used as antidiabetic agents for the treatment of type 2 (non-insulin dependent) diabetes mellitus. They activate the nuclear peroxisome proliferator-activated receptor-gamma (PPAR-gamma). This increases the transcription of various insulin-sensitive genes, improving insulin action and lowering blood glucose concentrations

2.4.1-Pioglitazone:**Side effect :**

- Sore throat, muscle pain, weight gain, or tooth problems may occur
- blurred vision), bone fracture, reddish-colored urine
- cause liver disease, (hypoglycemia)

Intrraction : gemfibrozil, rifamycins including rifampin

Beta-blocker medications (such as metoprolol, propranolol, glaucoma eye drops such as timolol) cause (hypoglycemia)

Contraindication : allergies., heart disease (such as congestive heart failure, chest pain), liver disease, fluid in lungs, swelling (edema), anemia, a certain eye problem (macular edema), bladder cancer .

2.5-Meglitinides: (nateglinide,repaglinide)

- Meglitinides stimulate insulin secretion from the pancreas
- Because of this, they are sometimes referred to as "insulin secretagogues"
- Insulin secretion is enhanced in response to a meal, but does not appear to be increased during periods of fasting.
- Because meglitinides enhance insulin secretion, they can cause low blood sugars (hypoglycemia).

2.5.1-Nateglinide**Side effect :**

- weight gain,
- runny or stuffy nose,
- sneezing,
- cough,
- cold or flu symptoms.

Intrraction :

corticosteroids (such as prednisone), psychiatric medicines (such as olanzapine), fluoroquinolone antibiotics (such as ciprofloxacin) nonsteroidal anti-inflammatory agents (NSAIDs) like ibuprofen(Motrin, etc.), aspirin and aspirin-like compounds, monoamine oxidase inhibitors like phenelzine (Nardil), and beta-blocking drugs like propranolol (Inderal)

Contraindication : allergies, medical history, especially of: kidney disease, liver disease, gout, During pregnancy, this medication should be used only when clearly needed.

2.5.2-Repaglinide :

Like the sulphonylureas, repaglinide acts by stimulating release of insulin from the β -cells of the islets of pancreas inhibiting ATP-sensitive K^+ channels, thereby activating the Ca^{++} channels with increase in intracellular calcium to release insulin

Side effect

- anxiety
- blurred vision
- chills
- cold sweats
- coma

Drug interaction:

- 1- Alcohol/Food Interactions
- 2- Disease Interactions

There are 5 disease interactions with repaglinide which include:

- Type I Diabetes
- Cardiovascular Risk
- Liver Disease • Renal Impairment.

Contraindication:

- severe infection
- low blood sugar
- pituitary hormone deficiency
- Addison's Disease
- Severely Decreased Function of the Cortex of Adrenal Gland
- Habit of Drinking Too Much Alcohol
- Alcohol Intoxication
- Liver Problems
- Injury
- A Mother who is Producing Milk and Breastfeeding

2.6-Alpha-glucosidase inhibitor

(acarbose):

- Alpha-glucosidase inhibitors work by slowing the absorption of carbohydrates from the intestine
- They slow absorption by inhibiting enzymes in the small intestine that are responsible for carbohydrate metabolism
- Alpha-glucosidase inhibitors are partially absorbed into the bloodstream, but their mechanism of action takes place entirely in the lumen of the small intestine.

2.6.1-Acarbose :

Side effect : Diarrhea, signs of liver problems (such as nausea/vomiting that doesn't stop, loss of appetite, stomach/abdominal pain, yellowing eyes/skin, dark urine). (hypoglycemia), gas, bloating, upset stomach

Interaction :

- digoxin (Lanoxin)
- diuretics ('water pills')
- estrogens
- isoniazid
- medications for high blood pressure or colds
- oral contraceptives
- pancreatic enzymes
- phenytoin (Dilantin)
- steroids
- thyroid medications

Contraindication :

- allergic to acarbose or to any of its ingredients
- have diabetic ketoacidosis
- have cirrhosis
- have inflammatory bowel disease, colonic ulceration, or partial intestinal obstruction.
- have chronic intestinal diseases or disorders of digestion or absorption
- have conditions that may deteriorate as a result of increased gas formation in the intestine

DRUG ACTION:

Acarbose, an inhibitor of intestinal alpha

- glucosidases, delays the digestion and absorption of
- starch and sucrose; it has a small but significant effect in
- lowering blood glucose

INDICATIONS AND DOSE :

- Diabetes mellitus inadequately controlled by diet or by diet
- with oral antidiabetic drugs
- BY MOUTH
- ▶ Adult: Initially 50 mg daily, then increased to 50 mg 3 times a day for 6–8 weeks, then increased if necessary to 100 mg 3 times a day (max. per dose 200 mg 3 times a day)

Chapter two
patient and
method

We collect data from type 2 diabetic patients who are admitted to Al-Diwaniyah teaching hospital and those who visit specialist doctors clinics and pharmacy.

Data collection process last for 3 months.

We ask the patient the following questions:

1. Name?
2. Gender?
3. Age?
4. Location ?
5. Duration of disease , medication used ?
6. About what the pharmacist told him on the medications and diet ?

we get about (51) case, most of cases (24 case) taking Daonil (

GLIBENCLAMIDE) tab 5 mg

JANUMATE +AMARYL =2 Cases

DAONIL+GLUCOPHAGE +AMARYL= 2 Cases

GLUCOPHAGE+GALVAS = 4 CASES

GLUCOPHAGE+GLUCOVANCE +DAONIL = 2 Cases

DAONIL +AMARYL = 2 Cases

GLUCOPHAGE = 4 Cases

GLUCOVANCE = 2 Cases

AMARYL = 3 Cases

DAONIL+ GLUCOVAGE = 6 Cases

Chapter three

Result

Information from the physician :

- Start with low dose 2,5 mg increased gradually to prevent hypoglycemia
- Not take DAONIL with aspirin , omeprazole, levofloxacin , captopril .

Patient Y take AMARYL:**Information from the pharmacist about the medication:**

-Take AMARYL after breakfast.

Information from the physician :

_Start with low dose 1mg to reduce side effects.

_Don't take it with aspirin , omeprazole, cimetidine , captopril.

Patient Z taking Glucophage (metformin) 850 mg :**Information from the pharmacist about the medication:**

_Take drug with or after meal immediately to prevent or reduce side effect.

_Take drug every 12 hour .

Information from the physician :

_Don't take drug with aspirin , clarithromycin, levofloxacin, diltiazem .

_Start with 850 mg/ h to reduce SE.

**Patient A taking GLUCOVANCE 500/5 mg
(metformin + glyburide) :**

Information from the pharmacist about the medication:

_take drug once or twice daily .

_Take with or after meal to reduce SE (NV,HYPOGLYCEMIA, RASH)

Information from the physician :

_start with low dose 1,25/ 250 mg once or twice daily and increase after
2 weeks .

_Don't take it with aspirin, cinnamon, Ketoprofen , mefenamic acid ,
omeprazole.

Chapter Four

Discussion

The physician sometimes give all the important information regarding medication and diet for type 2 diabetic patients .

The pharmacist may not have the sufficient time to give all information or the patient may not listen to the pharmacist .

As some oral anti diabetic drugs may cause hypoglycemia , the pharmacist or physician should advise patients to take some sweets after drug administration to avoid side effects (hypoglycemia).

GLYBURIDE should be taken before meals, but in true sense it does not make any difference even if it is taken after the meal. It works for more than 12 hours; hence, the total dose may be taken in two divided doses every day.

Aspirin can increase the effects of glyburide and cause your blood sugar levels to get too low. Symptoms of low blood sugar include headache, dizziness, drowsiness, nausea, hunger, tremor, weakness, sweating, and fast or pounding heartbeats. Talk with your doctor before using these medications together.

Glyburide oral will increase the level or effect of omeprazole oral by reducing stomach acidity. This interaction may occur when both drugs are taken by mouth.

captopril oral increases effects of glyburide oral by added effects.

Glyburide oral increases effects of levofloxacin oral by added drug effects. Quinolones may increase or decrease glucose levels. Gatifloxacin is most likely to produce dysglycemia (imbalance of blood sugar); moxifloxacin is least likely.

You should take Amaryl with a meal. If it was prescribed to you to take in the morning then take it with breakfast (i.e. with or immediately after eating) .

...Coadministration of either cimetidine (800 mg once daily) or ranitidine (150 mg bid) with a single 4-mg oral dose of AMARYL did not significantly alter the absorption and disposition of glimepiride, and no differences were seen in hypoglycemic symptomatology. Pooled data from clinical trials showed no evidence of clinically significant adverse interactions with uncontrolled concurrent administration of H₂-receptor antagonists.

NOTE// aspirin, omeprazole , captopril, lisinopril not used or used with care in combination with Amaryl for the same reason as glyburide.

metformin oral and levofloxacin oral

metformin oral increases effects of levofloxacin oral by added drug effects. Quinolones may increase or decrease glucose levels. Gatifloxacin is most likely to produce dysglycemia (imbalance of blood sugar); moxifloxacin is least likely.

clarithromycin oral and glipizide -metformin oral

clarithromycin oral increases levels of glipizide-metformin oral by the drugs competing to be bound to protein and therefore possibly increasing the amount of the drugs in the blood. Combination increases the chance of low blood glucose.

clarithromycin oral and glipizide-metformin oral

clarithromycin oral increases levels of glipizide-metformin oral by the drugs competing to be bound to protein and therefore possibly increasing the amount of the drugs in the blood. Combination increases the chance of low blood glucose.

Diltiazem Hcl oral and metformin oral

diltiazem Hcl oral will increase the level or effect of metformin oral by nonacidic drugs competing for the same pathway through the kidney.

cinnamon bark oral and glyburide-metformin oral

cinnamon bark oral increases effects of glyburide-metformin oral by added drug effects. Increased risk of low blood sugar (hypoglycemia). Monitor glucose levels.

ketoprofen oral and glyburide-metformin oral

ketoprofen oral increases effects of glyburide-metformin oral by unknown mechanism. Combination increases the chance of low blood glucose.

mefenamic acid oral and glyburide-metformin oral

mefenamic acid oral increases effects of glyburide-metformin oral by unknown mechanism. Combination increases the chance of low blood glucose.

aspirin oral and glyburide-metformin oral

aspirin oral increases effects of glyburide-metformin oral by unknown mechanism. Combination increases the chance of low blood glucose.

omeprazole oral and glyburide-metformin oral

omeprazole oral will increase the level or effect of glyburide-metformin oral by reducing stomach acidity. This interaction may occur when both drugs are taken by mouth.

Chapter Five

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26- <https://www.rxlist.com/drug-interactions/glyburide-metformin-oral-and-mefenamic-acid-oral-interaction.htm>

الخلاصة:

أن الهدف الرئيسي من إجراء هذا البحث وهذه الدراسة هو لأستكشاف دور صيدلي المجتمع في توفير التعليمات اللازمة لمريض يتعالج بأدوية السكر الفموية .
وكان المشاركون عباره عن نماذج مختارة من الصيادلة المجتمعيين في مستشفى الديوانية التعليمي وعينات من مرضى السكري النوع الثاني .

وكانت المقاييس الرئيسية للدراسة تعتمد على المدى الذي يلعب فيه الصيدلي المجتمعي دوراً هاماً في إعطاء المعلومات المطلوبة لمريض يتعالج بأدوية السكر الفموية.

حيث أظهرت النتائج دوراً بارزاً يلعبه صيدلي المجتمع في إعطاء معلومات هامة يحتاجها مريض السكري النوع الثاني : أهمها التفاصيل المتعلقة بالعلاج سواء بالكيفية السلمية لتناوله او بتنبيه المريض بكل شيء يتعلق بالعلاج والذي يصب في مصلحة المريض في النهاية.

وتم الأستنتاج من خلال مجموعة متنوعة من التدخلات والرصد، أنه يمكن للصيدلي المجتمعي تقديم مساهمة كبيرة،
ومع ذلك، يعتمد نجاح هذه التدخلات على بناء قنوات اتصال فعالة مع مختلف أخصائيي الرعاية الصحية .



وزارة التعليم العالي والبحث العلمي
جامعة القادسية
كلية الصيدلة

**دراسة حول دور الصيدلي المجتمعي في إعطاء التعليمات اللازمة
لمريض يتعالج بأدوية السكر الفموية**

بحث تخرج مقدم الى جامعة القادسية، كلية الصيدلة وهو جزء
من متطلبات نيل شهادة البكالوريوس في الصيدلة
تقدم به كل من
الطالبة حنين لفته حاكم والطالبة اصيل ناصر حاشوش

بإشراف الأستاذ الدكتور

د. صفاء كندوح