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Recognition of Potential Drug-drug Interactions in Diabetic's Patients in Hospital Pharmacy

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ABSTRACT

Diabetes is a disease that affects your body's ability to produce or use insulin. Insulin is a hormone. When your body turns the food you eat into energy, insulin is released to help transport this energy to the cells. Insulin acts as a "key." Its chemical message tells the cell to open and receive glucose. If you produce little or no insulin, or are insulin resistant, too much sugar remains in your blood. Blood glucose levels are higher than normal for individuals with diabetes. A survey has been conducted by us, in which we went to a Hospital to collect information about diabetic patient and after the study we found out that there were some common medicines which were given to those patients with different doses.

Keywords: Drug-Drug Interactions (DDI's), Diabetes, BMI, Cholesterol, Laxix, PDDI's.

1. INTRODUCTION

Diabetes mellitus is a metabolic muddle characterized by the presence of hyperglycemia due to imperfect insulin secretion, imperfect insulin action or both. The chronic hyperglycemia of diabetes is associated with relatively specific long term micro vascular complications affecting the eyes ,kidney and nerves, as well as increased risk for cardiovascular disease (CVD). DM can be due to autoimmune destruction of B-cells of pancreas causes decrease level of insulin which leads to abnormalities in carbohydrates, fat, protein metabolism. Type 1 diabetes is regularly diagnosed in children and young adults, previously it was known as juvenile diabetes. Among 100% only 5% of people with diabetes have this type of the disease. The body breaks down the sugars and starches in meal which the person will eat into a simple sugar called glucose which it uses for energy. Insulin is one type of hormone that the body will get glucose from the bloodstream into the cells of the body. By using insulin therapy and other treatments, all the diabetic patients even young children can learn to manage their condition and live long and healthy lives. Type 1 diabetes happens when immune system destroys beta cell which is present in pancreas. Beta cell is the cell which will produce insulin. The real cause of type 1 diabetes is still unknown. In most of the people with diabetes, the body's immune system which normally fights with bacteria and viruses, by mistake will destroy the insulin producing cells in the pancreas. Genetic and exposure to certain environmental factors such as viruses may play role in this process. Common symptoms Increased thirst, Frequent urination, Bedwetting in children who previously didn't wet the bed during the night, Extreme hunger, Unintended weight loss, Irritability and other mood changes, Fatigue and weakness, Blurred vision, In females, a vaginal yeast infection. It is a progressive condition in which the body becomes resistant to effect of insulin, and gradually loses capacity to produce enough insulin in the pancreas. It occurs primarily as a result of obesity and not enough exercise, poor diet and classic apple shape body where extra weight is carried around the waist. Common symptoms

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include: increased thirst, headache, itching, skin infection, frequent urination, and unexplained weight lost, increased hunger, feeling tired and sores that do not get heal. Long term complications include heart disease, stroke, diabetic retinopathy which can result in blindness, kidney failure.

2. WHY ARE ASIANS AT HIGHER RISK?

Through Studies and surveys' it has been found out that Asians have higher risk of developing type 2 diabetes, when they were compared with people of European countries. Asians are more prone to develop the disease even at a lower BMI (body mass index). This means that some Asian populations currently have a lower prevalence of overweight and stout individuals than populations in the West; they have unreasonably high percentage of people with diabetes. 60% of the world's diabetic patient's populations are from mainly Asian countries. The reason of higher risks may occur because Asians, especially South Asians, are more expected to have less muscle and more abdominal fat, which increases insulin resistance. For example, according to survey conducted, it was find out that; Indian newborns have a lesser standard body weight compared to white newborns, Indian newborns have higher levels of body fat and insulin. Imaging technology that measures fat in humans has shown that Asians of a healthy BMI have excess fat around body organs and in the belly area than Europeans with the same BMI. For the Asian, rather than just calculating BMI, measure the length around waist (waist circumference) to predict the diabetes risk more accurately. You can measure waist circumference by putting a tape measure around the body just above hipbone, usually at the level of the belly button. Even though you have a normal BMI, with an "apple-shaped body" (with excess fat around the waist) increases the diabetes risk. Your objective of measurement for waist circumference should be less than or equal to 90 cm for men and 80 cm for women. If a pregnant mother takes poor nutritions, when that baby grows up, he or she would be more liable to have high blood sugar level, especially if hastily transitioning to a diet high in refined carbohydrates, sugary beverages, or fatty Western fast foods. Air pollution, an increasing problem in Asia, may also increase risk of insulin resistance and diabetes.

3. DATA COLLECTION

3.1. Sagar hospital

Address: Shavige Malleshwara Hills, Dayananda Sagar Institution campus, Kumaraswamy Layout, Bengaluru, Karnataka 560078. At 9.30 am to 12 pm two members were available for collecting the data from patient profile and used paper and pen for data collection.

4. CHALLENGES FOR DATA COLLECTION

A prospective observational study was carried out at one of the Hospital in Bangalore with the motive of identifying Drug-Drug Interactions, Drug-Food/beverage Interactions, and Dose Adjustments. The study was initiated after obtaining approval from higher authorities. A number of drugs prescribed were entered into a suitably designed data collection form. Many problems occurred while gathering the data and information's from the Hospital. We were not being entertained by the doctor, as he was not ready to share the information with us. As pharmacists play a vital role in the health care system through the medicine and information they provide. They were not ready to share their information. Generic name of the medicine should be prescribed every time not the trade name or brand name.

5. BASIC NEEDS

Basic needs of Diabetic patient start with a well-balanced diet that includes carbohydrates (carbs), protein, and fat. Carbs (found in vegetables, starches, milk/yogurt, fruit and sweets) turn into glucose (sugar) in the body. The body necessitates carbs for energy. Eating excess of carbs can raise blood glucose levels too high, but it is important not cut out these foods. Eating less carbs may increase your blood sugar level. Table 1 represents of basic reason with trips of diabetic patient.

Table 1
Basic Reason with Trips of Diabetic patient

Reasons	*Tips*
Having meal at regular time will help your body to control blood sugar levels.	Try to have 3 meals per day at regular time and do not keep gap more than 6 hours between your meals.
If glucose intake is higher there is risk of increased levels of blood glucose. Artificial sweeteners can be beneficial to keep optimum levels of blood sugar.	Try to reduce food contains sugar such as jam, candies, honey, etc.
Foods which contain more fibers may reduce your blood glucose and cholesrtol levels, as it gives fullness feeling.	Try to have foods rich in fibers like brown rice, dried beans, peas, cereals, grain breads, vegetables and fruits.
Fruit juice and pops regular intake will increase your blood glucose levels.	Drink more water.
Doing regular exercise and keeping your fit will help in lowering your blood sugar levels.	Try to do half an hour work out every day.

5. MEDICINES FOR DIABETES

Here Table 2 represents the Common Medicine list for Diabetic patient.

Table 2
Common Medicine list for Diabetic patient

S. No	*Name of Medicine*	*Dosage (Mg/Tab)*
1	METFORMIN	500, 850, 1000
2	GLIMEPIRIDE	1, 2, 4
3	GLIPIZIDE	5, 10
4	REPAGLINIDE	0.5, 1, 2, 4
5	MIGLITOL	25, 50, 100

6. RESULT AND ANALYSIS

In day 1 and 2 they did not give any insulin injection and the average e value of day 1 is 145.5, the average value of day 2 is 214. In day 3 at 7 pm and 10 pm the blood sugar level was high and insulin therapy as per

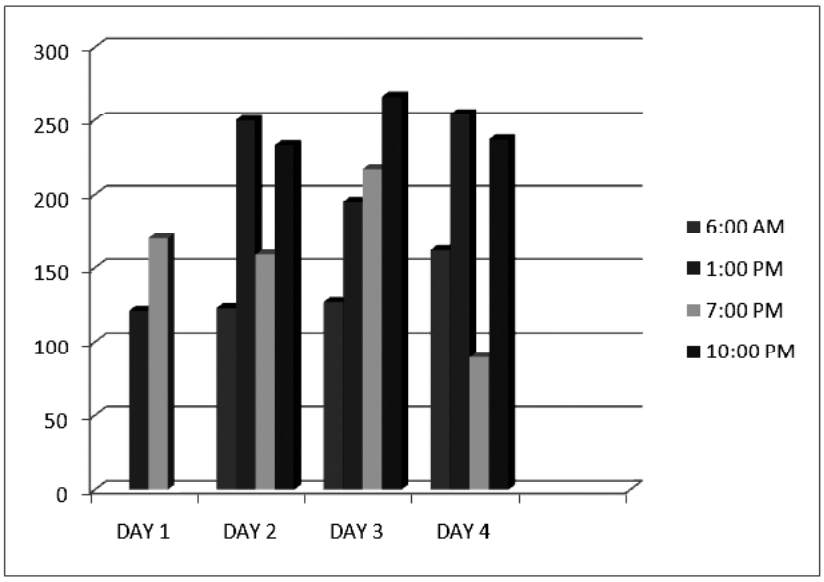

Figure 1: Comparison of Medicine dose

protocol started and the average value is 226.3333. In day 4 at 1.15 the patient suffered from hypoglycemia (low blood sugar) so 5% dextrose injection given and at 1 pm and 10 pm the patient had high blood sugar and the average value is 193.6667. Figure 1 represents the comparison of medicine dose.

7. DISCUSSION

Table 3
Medicine list for Diabetic patient1

Brand Name	*Dose and Frequency*	*day 1*	*day 2*	*day 3*	*day 4*	*day 5*
INJ.R.JET	20 mg 1-0-0	V	V	V	V	V
C. CERUVIN.AF	20 mg 1-0-1	V	V	V	V	V
T. ROSUVAS	20 MG 0-0-1	V	V	V	V	
INJ.HEPARIN	5000 U 1-1-1	V	V	V	V	V
T. BETALOC	25 mg $^{1}/_{2}$-0-$^{1}/_{2}$	V	V	V	V	V
T. LANOXIN	0.25 mg $^{1}/_{2}$-0-0	V	V	V	V	V
INJ.LASIX	20 mg (Reduced)*	V				
INJ.HEPARINE	5000 u		V	V		
INJ.LASIX	10 mg 1-1-1		V	V	V	V
T. GEMER-FORT	1 Tablet 1-0-1			V	(Stopped)*	
T.OLMET NACEL	20 mg			V		
SYP.POTKLOR	10 ml 1-1-1			V	V	V
T. MUCINAC	600 mg 1-0-1				V	V
IN J.H. ACTRAPID	6 units				V	V
T. GEMER	1-0-0					V

*1. **INJ. LASIX** COMPOSITION – FUROSEMIDE (They reduced the dose of INJ.LASIX)

*2. **GEMER-FORT** COMPOSITION - GLIMAPIRIDE (2mg) + METFORMIN (100mg). (Because combination of this tablet with insulin may cause hypoglycemia)

Table 3a
Medicine list for Diabetic patient2

Brand Name	*Dose and Frequency*	*Day 1*	*2*	*3*	*4*	*5*
INF. LASIX	10 mg/hr	√	√	(Stopped)[1]		
CAP. CERUVIN	150 mg 0-1-0	√	√	√	√	
TAB. TONACT	10 mg 0-0-1	√	√	√	√	
TAB. LANOXIN	0.25 mg 5/7 $^{1}/_{2}$-0-0	√	√	√	√	√
TAB. RAMISTAR	1.25 mg 0-0-1	√	√	√	√	
TAB. PROLOMET	12.5 mg 0-0-1		√	√	√	
TAB. ZYTANIX	2.5 mg 1-0-0		√	√	(Stopped)[2]	
TAB. ALDACTONE	50 mg 1-0-0		√	√	√	(Stopped)[2]
INJ. LASLX	40 mg 1-1-1					√
INJ. HUMAN	S/C				√	√

1: Initial phase of treatment is infusion Lasix for 2 days, if we continue it causes serum electrolyte imbalance, so its stoped.

2: the drug zytanix causes hyponatremia in the patient, so it shouldn't be given for long time

3: aldactone causes hyperkalemia (increased amount of potassium in the body) so after few days they started inj lasix for balancing the electrolytes, and removal of extra potassium from the body.

Table 4
Medicine list for Diabetic patient3

DRUG	*Day 1*	*Day 2*	*Day 3*	*Day 4*	*Day 5*	*Day 6*	*Day 7*	*Day 8*
CAP.CERUVINA AF 150	✓							
TAB.ROSUVAS 40 mg	✓	✓	✓	✓	✓	✓	✓	
INJ.LASIX 40 mg IV	✓	✓	✓	✓	✓	✓	✓	✓
T. METOSARTANM 50 mg	✓	✓	✓	✓	✓	✓	✓	✓
TAB.MONOTRATE 10 mg	✓	✓	✓	✓	✓	✓	✓	
TAB.ALPNAX 0.5 mg	✓	✓	✓	✓	✓	✓	✓	
INJ.NOVA 3 S/C 20 U	(with hold)					✓		✓
TAB.GLYCOMET SR	✓	✓	✓	✓	✓	✓	✓	npo
T. AMILONG 5 mg	✓	✓	✓	✓	✓	✓	✓	npo
INJ. HEPARIN 5000 IU IV	✓	✓	✓	✓	✓	✓	✓	
SPOROLAC SATCHET TID			✓	✓	✓	With hold		
T. METROGYL 200 mg			✓	✓	✓	With hold		
T. AVIL 25 mg			✓	✓	✓	✓		
T. ZENTAL 400 mg HS			✓	✓	✓			
NEB. DUOLIN + BUDE CORT			✓	✓	✓	✓	✓	✓
INJ. PIPTAZ 2.25 mg					✓	✓	✓	✓
INJ.EMESET 4 GR IV						✓		
T.STROCIT 500 mg						✓	✓	✓
INJ.MANITOL 50 ML						✓	✓	✓
T.DIXIN 0.25 mg OD							✓	✓
T.HAEM UP PO OD								✓
T.ZINCOVIT PO						✓	✓	
T.FOLVIT PO OD					✓	✓	✓	✓
T.ACITROM 1 mg								✓
ACUDENT 10 mg							✓	✓
T.LASIX 40 mg							✓	✓
T.SODAMINT							✓	✓

1. They give inj.NOVA 3 (insulin) pre and post operation, because it will cause the wound to heal faster.
2. It's used to balance the microflora in intestine during diarrhea condition.
3. As the patient got diarrhea, they gave antibiotic metrogyl for anaerobic infections in intestine.

8. COMPARISON BETWEEN THREE PATIENTS

Table 5
Comparative Medicine list for Diabetic between Three Patients

S. No	*Nebulizer*	*Infusions*	*Injections*	*Syrup*	*Powders*	*Capsuls*	*Tablets*
Patient no.1	0	0	7	1	0	1	7
Patient no.2	1	0	6	0	1	1	19
Patient no.3	0	1	2	0	0	1	6

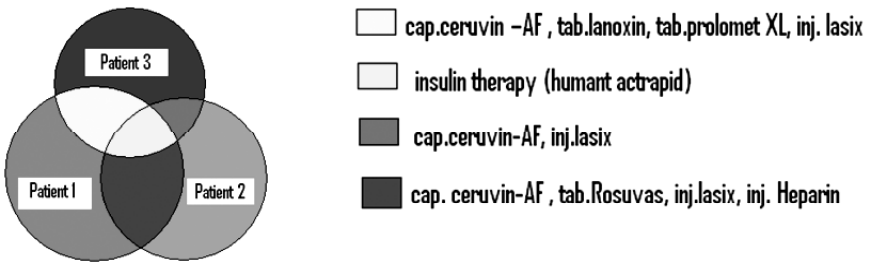

Figure 2: Comparison of Medicine list for Diabetic between Three Patients

9. CONCLUSION

In this research paper our main focus was on Diabetic Patient, focusing on the current study we concluded that some medicines were common for all the patients with different levels with different doses. This may lead us to a better prescription standard. This approach may lead to an improvement in the quality of prescription, reducing possible risks and thus contributing to patient safety. These days there are some zone wise treatments available around the world with new technologies and standards for Diabetes patients.

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