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Need of Pharmacist's role in patient counseling on Insulin dependent Diabetes Mellitus Management

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ABSTRACT

The patient was with known diagnosis of diabetes mellitus type 1 with a headache and giddiness at the time of admission. We herein describe a case of the 14 years old patient with the plasma glucose level had given negative results to DM, as well as her laboratory tests also showed that she had poorly controlled DM and minor ear wax problem. Patients present with diabetic ketoacidosis after several days of polyuria, polydipsia, polyphagia and weight loss. The patient was found underweight due to her low BMI and she had multiple admissions of diabetic ketoacidosis and DM. Her RBS was too high until out of normal range. Furthermore, the lab result showed the glucose was found presence in her urine test. The effective patient counselling was given to diabetes mellitus along with the insulin treatment and along with other relative drugs to increase the patient's quality of life. Our case emphasizes that early recognition and appropriate patient counselling by the pharmacists may significantly overcome the symptoms and prevent complications of diabetes mellitus which may enhance the quality of life in patients at any age.

Keywords: Patient Counseling, Chronic complications, Diabetic ketoacidosis, Hypoglycemia

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INTRODUCTION

Diabetes mellitus (DM) type I is an autoimmune disease with chronic complications that is becoming more frequent as life expectancy of diabetics has increased owing to improved methods of detection and better management[1].

Observation

A 14 year-old Indian girl with a weight of 37.3 kg and height of 156cm was admitted to pediatric department on 10th October 2013. She was underweight as her BMI was 15.3. She had complained that she was suffering from headache and giddiness for four days and fever for one day. She claimed that she had frontal headache, prickling in nature associated with giddiness. She did not attend school due to headache and giddiness. However, she did not have blurred vision or fits. She neither had syncopal (loss of consciousness) attack of fainting episodes nor loss of consciousness. She did not feel chilling or rigors. No tinnitus as well as vertigo problem found in her. Apart from that, there were no complaints on rash, burning micturition, ear discharge, cough, vomiting, diarrhea, abdominal pain chest pain, reduced sensation over limbs, tingling and numbness sensation, polyuria, polydipsia, polyphagia, passing frothy urine skin lesions or ulcers. There were no symptoms of hypoglycemia like palpitation, tremors, slurring of speech as well. She did not do home monitoring for the past 3 days as the strip finished. From her past medical history, she was diagnosed Type I Insulin dependent Diabetes Mellitus since September 2007. She had multiple admissions for Diabetes Keto Acidosis and uncontrolled Diabetes Mellitus. Her last admission was in May for acute gastritis. Her DXT monitoring at home ranged between 7-14 mmol/L. Her latest HbA1c was in July and it was 13.8%. The patient takes subcutaneous insulin on her own. Besides that the patient was born post date 1 week via spontaneous vaginal delivery and antenatally, antepartumly and postnatally was uneventful. Her immunization was completed up to her age. Her last menstrual period was on 20 September 2013 and she has regular menses of 3-4 days with no blood clots and no dysmenorrhoea. She lives with her parents and siblings. She is the second of three siblings. Her father, 43, is an estate worker and a smoker but healthy. Her mother, 37, is a factory worker. She was just diagnosed to have type 2 Diabetes Mellitus. Her elder brother, 18, is a factory worker and her younger brother,12, is a student. Both of them are healthy. Nevertheless, her maternal mother has hypertension. The patient is a Form 2 student with good performance in school and sports. Before this, she took normal adult diet. Patient was alert conscious, pink, well hydrated, no acidotic breathing, no tachypnoiec, comfortable Vital Signs:BP 100/70, Temperature 37.2, SPO2

98 %. *Neurological examination*: Fine and crude touch intact, Position sense intact, No glove and stocking paraesthesia. *Respiratory*: Clear and equal air entry, No subcostal recession. *CVS*: Apex beat left sided, Normal S1,S2 (heart sound), No murmurs Abdomen *Musculoskeletal*: Abdomen soft and non tender, No hepatospleenomegaly *Others*: No lower limb ulcers.

DISCUSSION

From the patient's chief complaints and based on the results of all the lab tests, the patient was diagnosed with poorly uncontrolled insulin independent Diabetes Mellitus type I and minor ear wax problem. She had been prescribed subcutaneous Mixtard 30/70, 26 units in the morning;16 units at night , Sodium chloride 20% 10 ml tds, and Sodium Bicarbonate ear drops 1/1 bd. The important laboratory diagnosis for type I DM depends on glucose in the urine (glucosuria).In order to measure the metabolic response of a patient to glucose, the glucose tolerance test was devised. The patient had shown undesired plasma glucose levels in her daily testing. Her results showed that her plasma glucose decreased but still high when compared to the desired range. During the interview with the pharmacist, she claimed that she had been compliance with insulin therapy yet the plasma glucose level is still undesirable. Her laboratory tests also showed that she had poorly controlled DM. Patients present with diabetic keto acidosis after several days of polyuria, polydipsia, polyphagia and weight loss. The patient was found underweight due to her low BMI and she had multiple admissions of diabetic ketoacidosis and DM. Her RBS was too high until out of normal range. Furthermore, the lab result showed the glucose was found presence in her urine test. *Subcutaneous Mixtard 30/70 was administered* to the patient that helps to prevent the blood sugar level from becoming too high. Very high blood sugar levels may lead to ketoacidosis which was not seen in this patient. Sodium chloride was administered immediately to restore adequate perfusion and hemodynamic stability, also for minimizing the risk of cerebral edema by reducing the rate of fluid repletion varies. Other than DM, the patient had an ear wax problem. Thus, she was prescribed Sodium Bicarbonate ear drops. This is used for ear wax cleaning. It may soften up and assist it coming out. Effective bedside counseling and patient counseling was given to the patient and patient caregiver on diabetes mellitus on the day of discharge on proper use of medication, screening for drug interactions, explained monitoring devices, and made recommendations for ancillary products and services were performed. The pharmacist, although were not the health care professional to diagnose diabetes, but they have importance in helping the patients maintain and control of their disease.

Pharmacist's role in Patient Counseling on DM

***Counseling regarding lifestyle modifications*:**

While counseling regarding the lifestyle modifications, the pharmacist should focus on the key areas including diet, exercise, smoking and alcohol intake.

Diet, Exercise & Alcohol intake:

If fiber rich food such as whole meal bread, jacket potatoes, etc. are eaten, then the carbohydrate content of the diet makes up to 50% to 55% of the calories. People with diabetes should limit their sugar intake, can eat raw fruits but not as excessive. Obesity is a major problem in diabetes, and fats contain more than twice the energy content per unit weight than either carbohydrate or proteins. More severe restrictions may be indicated for individuals with hypercholesterolemia. Dietary fiber has two useful properties. Firstly it is physically bulky and increases satiety. Secondly, fiber delays the digestion and absorption of complex carbohydrates, thereby minimizing hyperglycemia. In type 1 diabetes, care must be taken to have adequate metabolic control prior to exercise and to monitor blood glucose before and after exercise. Exercise is not recommended if the patient has poorly controlled labile blood glucose level or is at increased risk of diabetic complications. Strenuous exercise is not wise in patients prone to develop hypoglycemia.A standard recommendation for diabetic patients is that exercise should include a proper warm-up and cool- down period. A warm up should consist of 5-10 min of aerobic activity (walking, cycling, etc.) at a low intensity level. The warm-up session is to prepare the skeletal muscles, heart, and lungs for a progressive increase in exercise intensity. After a short warm- up, muscles should be gently stretched for another 5- 10 min. Primarily, the muscles used during the active exercise session should be stretched, but warming up all muscle groups is optimal. The active warm up can either take place before or after stretching. Following the activity session, the cool- down should last about 5- 10 min and gradually bring the heart rate down to its pre- exercise level. Modest amount of alcohol will significantly alter blood glucose levels.

***Counseling regarding the disease*:**

The diabetic patients should be explained that the disease is lifelong, progressive and needs necessary modifications in the lifestyle pattern. They should also stress upon the importance of pharmacotherapy, especially the need for strict compliance with the prescribed medication. The patients should be also explained that the disease may affect the quality of life if not well controlled.

Insulin:

All patients with type 1 diabetes require insulin. Since insulin preparations may differ by source, onset of action, time to peak effect, and duration of action, the pharmacist must teach patients for how to use insulin pen.

Table 1.Direction for using insulin pen

Location/site	Abdomen (around the navel) ,Front and side area of thighs, Back above waist, Buttocks
Procedure	Injection to stay 1 inch away from previous injections, Stay 2 inches away from your navel or scars, Do not use sites that are bruised, tender or swollen. Clean the skin with an alcohol pad and let the alcohol air dry and take the cover off the pen where the patient can see the insulin in the pen. If been using a cloudy insulin, gently roll the pen between your hands to mix the insulin.Use alcohol to clean the end of the pen where the needle twists on. Peel back the cover of the needle. Screw the needle onto the pen. It should be snug but not too tight. Must clear the air out of the pen: to remove the cap from the needle and turn the dose dial to 2 units further hold the pen so the needle is up in the air and push the end of the pen in to clear the air. Watch the tip of the needle for a drop of insulin.

Counseling on Acute complications

The pharmacist should focus on strategies to prevent the occurrence of the acute complications.

Hypoglycemia:

It is a condition caused by abnormally low levels of blood glucose. Initial symptoms may start with sweating, tremulousness, nausea and vomiting, dizziness, mood change, hunger, weakness and progress to the intermediate symptoms of confusion, poor coordination, headache and double vision. The advanced symptoms are unconsciousness and seizures. The management of hypoglycemia includes taking half a cup of any fruit juice, 2 or 3 glucose tablets, 2 tablespoons raisins, 1 or 2 teaspoons of sugar or honey, half cup of regular soft drink or liquid concentrated glucose. For advanced hypoglycemia, medical intervention is needed with glucagon 1 mg subcutaneously or intramuscularly. Hypoglycemia can largely be prevented by taking insulin therapy properly, eating regular meals, and regular checking of blood glucose.

Diabetic keto acidosis (DKA):

The risk factors include extremes of age, poor glycemic control, poor socioeconomic status, non-compliance etc. In general, insulin omission or non-compliance is identified as an important contributing factor for the development of DKA. The pharmacist can counsel the patients regarding the strategies to prevent the occurrence of DKA (Diabetric ketoacidosis).

Counseling on chronic complications

Chronic complications of diabetes can adversely affect the quality of life, these complications should be emphasised and this can be prevented by strict compliance and suitable lifestyle

modifications.

Table 2.Counseling on chronic complications

Diabetic neuropathy	Patients must be informed the loss of pain or touch sensations in the feet which further cause pain in the legs, arms or hands. Hence frequent check ups to rule out diabetic neuropathy is essential. For prevention, the blood glucose and blood pressure should be kept in close monitoring. The other precautions include stopping/limiting alcohol intake, regular checking of feet every day and quitting the smoking.
Diabetic retinopathy	The HbA1c ideally around 7% or 53 mmol/mol) and blood pressure control (<130/80 mm Hg)should be maintained to avoid diabetic retinopathy. Encourage them to follow the screening tests.
Diabetic nephropathy	Poor control of diabetes is associated with enlargement of the kidneys and impairment in their function.
Infections	Counsel and advice the patients on relation with the poor diabetes control. and infection stages, and also the life threatening sepsis in these patient.

Counseling regarding self Monitoring of Glucose.

Counseling sessions were more successful in conveying the practical aspects of to carry out monitoring for the purpose of monitoring and the interpretation of results[2]. Self monitoring of blood glucose concentrations has the potential to lower glycemia and to decrease diabetic retinopathy, nephropathy and neuropathy.

Miscellaneous:

The pharmacist should also provide additional counseling for the patients as follows in Table 3.

Table 3. Counseling on Miscellaneous

Complication	Counseling
Foot care	Meticulous footcare and the choice of suitable foot wear can prevent serious damage which is likely to occur in diabetics.
Eye care	Eye exam every year. Inform the Clinician in case of any problems like blurring of vision or seeing dark spots,flashing lights.
Oral hygiene	Brushing teeth twice to prevent the signs of gum disease include long term bad breath or bad taste, swollen, red, tender, and shrinking or bleeding gums, pus between teeth; changes in the bite, tooth position or denture fit or tooth loss.

CONCLUSION

Diabetes is a chronic illness that requires a combination of pharmacological and non-pharmacological measures for better control. Patients need to know how to adjust insulin to maintain glucose levels in the range of 70-120 mg/dL (3.9-6.7 mmol/dL) before meals[3]. Insulin regimens need to be individually tailored to meet each patient's needs. Patient adherence to medication and lifestyle modifications plays an important role in diabetes management[4]. Pharmacists being an important member of the health care system have an immense responsibility in counseling these patients. To be an effective counselor[5], the pharmacist should

update his knowledge regarding the latest developments and should possess adequate verbal and non-verbal communication skills.

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REFERENCES

1. Arslan D, Merdin A, Tural D, Temizel M, Akın O, Gündüz S, Tatlı AM, Avcı F, Uysal M. The effect of autoimmunity on the development time of microvascular complications in patients with type 1 diabetes mellitus. Med Sci Monit, 2014 .(10);20:1176-9.
2. Donald S. Fong et.al, Retinopathy in Diabetes, Diabetes Care; 2004; 27 (1):84-87.
3. Elizabeth Peel, Odette Parry, Margaret Douglas and Julia Lawton "Blood glucose self-monitoring in non-insulin-treated type 2 diabetes: a qualitative study of patients' perspectives. British Journal of General Practice, 2004; 54,183-188.
4. V. Swetha E, Ocular Associations of Diabetes Other Than Diabetic Retinopathy, Diabetes Care 2008; 31(9): 1905-1912.
5. Hoffman RP. Practical management of type 1 diabetes mellitus in adolescent patients: challenges and goals, Treat Endocrinol 2004; 3 (1):27-39.
6. Mayer B. Davidson, MD, Maria Castellanos, RN, Don Kain, MS, MA, Petra Duran. The effect of self monitoring of blood glucose concentrations on glycated hemoglobin levels in diabetic patients not taking insulin: A blinded, randomized trial; American Journal of Medicine"2005; 118, (4), 422–425.

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