INTRODUCTION

Medication therapy management (MTM) is a model to enhance collaboration between pharmacists, doctors and other health workers; improve communication between patients and health care teams; and optimizing drug use to improve patient health. One of the elements in MTM is a comprehensive review of patient treatment called Medication Therapy Review (MTR). MTR is comprehensive, ideally the patient reporting all medications currently used to the pharmacist, including all prescription and non-prescription drugs, herbal products, and other dietary supplements. The pharmacist then assesses drug-related issues, including adherence, and worked with patients, physicians, or other health pret aholofessionals to determine the appropriate options for solving the identified problems.

Case Presentation

Data Collection

A 64-year-old woman, having diabetes since 11 years ago (at the age of 53 years). Patients were given a combination of Oral Anti Diabetes (OAD) therapy of 5 mg Glyburide taken before first meal and 500 mg of Metformin taken 3 times daily after meals. During the treatment process, patients routine use the medications and only 1-2 times forgot to take the medicine. The level of education is only up to elementary school, but had a good memory of health information. She had high-calorie diet because of often feel hungry and easy for snacking fried foods which are sold, lack of physical activity.

The main complaint

After out of the hospital patients still feel nausea and vertigo, SMBG at the time of fasting and 2 h post prandial still above 300 mg/dL. On December 30, 2016 patients undergo laboratory examination with the following results:

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting blood glucose</td>
<td>378 mg/dL</td>
</tr>
<tr>
<td>Prandial blood glucose</td>
<td>395 mg/dL</td>
</tr>
<tr>
<td>Triglyceride</td>
<td>259 mg/dL</td>
</tr>
</tbody>
</table>

Drug therapy recorded by Pharmacist with homecare on 4 January 2017 with previous medical history is as follows:

<table>
<thead>
<tr>
<th>Name of Insulin</th>
<th>Type of Insulin</th>
<th>Dosage of Insulin</th>
<th>Number of Insulin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humalog®Fleek Pen</td>
<td>Lispro</td>
<td>3 x 4 units</td>
<td>2 pens (residual)</td>
</tr>
<tr>
<td>Novorapid®Fleek Pen</td>
<td>Aspart</td>
<td>3 x 4 units</td>
<td>2 pens (new prescription)</td>
</tr>
</tbody>
</table>

Prior to the insulin, the patient also received oral medication as follows:

- Glucodex (gliclazide): 1 tablet in the morning
- Dimenhydrinate : three times a day
- Betahistine 6 mg : three times a day
- Gemfibrozil 300 mg : 1 capsule in the evening

Pharmaceutical Assessment

Based on data that has been collected, pharmacists classify the patient’s treatment needs as follows:

<table>
<thead>
<tr>
<th>Laboratory Results and Assessment</th>
<th>Drug Related Problems</th>
</tr>
</thead>
</table>

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Athiyah, Aditama, et al.: Medication Therapy Review

Humalog®

Medical problem:
DM type 2 in Elderly

FPG: 378 mg/dL
Prandial: 395 mg/dL
SMBG: >300 mg/dL

Need additional drug therapy

Drug therapy:
Novorapid® Flex Pen (3 x 6 unit)
Glucodex (once daily)

Insulin rapid is ineffective, need dose adjustment or replaced with basal insulin.

Safety

Patients do not understand the medicine had replaced.

Compliance

Humalog® Kwik Pen (3x 4 units) than switched with Novorapid® Flex Pen (3 x 6 units)

Patients are confused to use the drug, potentially double therapy.


discussion

Based on the results of pharmaceutical assessment, there are problems in the selection of insulin types seen from the target value of fasting blood sugar and 2 h pp that has not been achieved. Type of insulin that suits the needs of elderly patients is basal insulin combination with oral sulfonylurea or mixed-insulin. Based on Beer’s Criteria, the recommended insulin therapy in elderly is non-sliding scale insulin and does not use long acting sulfonylurea.30 In this case patients get gliclazide, is in accordance with diabetes management guidelines in elderly.

In these patients, therapeutic targets have not been achieved because the combination of insulin rapid and sulfonylurea has not been optimal either from the aspect of choice of therapy or dose. Patients weighing 56 kg had a need for insulin with a dose of 0.1 units/kg of body weight per meal and adjusted based on blood sugar. Patients received an initial dose of 3 times daily 4 units each, the dose and treatment results have not reached the target, dose adjustment required.27

Insulin storage also needs attention due to insulin stability. Before use, insulin is stored in the stable temperature range of 2°-8°C. The insulin being used is sufficiently stored at room temperature and protected from heat. Extreme temperature changes can affect the insulin stability caused by hydrolysis.28,29 In the drug delivery activity to the patient, the pharmacist is the last health worker to be encountered by the patient. In the chronic disease service, the pharmacist needs to pay attention to the residue of the patient’s medicine at home. It is important to maintain the effectiveness and efficiency of treatment. In the insulin service with a 3 x 4 unit regimen, it takes 360 units of insulin for 1 month. Patients will get 2 pen insulin that can be used for approximately 50 days, while patients redeem the medicine every month and will receive 2 pen insulin again. This results in an excess of the amount of insulin the patient receives. If insulin storage is not appropriate, it will have an impact on the effectiveness of insulin therapy. In these patients there was considerable residual insulin stored at room temperature because the patient did not have a refrigerator.

Some of the barriers to treatment may be due to cultural issues, educational level, language barriers, literacy levels, and other characteristics of patient communication skills that may affect outcomes. Insulin is a high alert drug, it needs special services to deliver insulin to the patient to be used properly and safely.30

Pharmacists have a strategic role in the monitoring and evaluation of patients treatment to detect symptoms that can be attributed to side effects caused by current treatment, interpreting, monitoring, and assessing the outcomes of patients' treatment. Through the MTR service, the Pharmacist may assess, identify, and prioritize treatment related to issues related to the clinical suitability of each drug used by the patient, including benefits versus risk, dose adjustment and dose regimen of each drug, including indication, contraindications, potential side effects, and potential treatment-related problems. Pharmacists have a strategic function to prevent duplication of therapy or unnecessary drugs, monitor patient compliance with treatment, identify illness or untreated conditions, consider medical expenses and consideration of access to health services / drugs and may initiate collaboration with other health care personnel.

acknowledgement

The integrated service station for elderly (Posyandu Lansia Mawar) at Indonesia, East Java, Surabaya.

conflict of interest

The authors declare no conflict of interest.

Abbreviations used


REFERENCE

9. Martin et al. How long should insulin be used once a vial is started?. Diabetes Care, 2003;26(9):2665-9.