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IMPACT OF UNDIAGNOSE DEPRESSION ON THE CONTROL OF DIABETES MELLITUS

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SUMMARY

Introduction: Diabetes Mellitus type is commonly affecting older adults and is a known cause of morbidity and mortality. Compliance to medications and treatments are the crucial aspects towards better diabetic control.

Case report: This case study is about a 66 year old elderly lady, with a background of Diabetes Mellitus for 13 years with co morbid hypertension and hyperlipidaemia for 12 years and also below knee amputation. Her main problems were uncontrolled diabetes due to poor compliance to medications and diet as a consequence of possible depression since last year when her left leg was amputated. On top of having poor diabetic control, patient is also experiencing language barrier. The depression has not only causing her poor compliance but also fluctuation in her glycaemic control.

Conclusion: This case has shown the importance of communication barrier issue on the control of illness such as diabetes mellitus. As a consequence of communication barrier, the case being studied did not comply with diabetic medications and diet and was also unable to express her distress. The management of her current poorly controlled diabetes could have been improved if she had better understanding on the underlying illness, received proper health education, supportive treatment and also psychological assessment, proper diagnosis and rehabilitation for her underlying depression.

Key words: Diabetes mellitus, Depression, Amputation, Poor Compliance, Poor diet control

1.0 Introduction

Diabetes mellitus is one of the commonest non-communicable diseases in Malaysia. An alarming 3.6 million adults are estimated to be affected by diabetes in Malaysia. Diabetes is a chronic disease that has no cure, due to the inability of the body to produce or properly use insulin, a hormone that is needed to convert sugar, starches, and other food into energy needed for daily life. Uncontrolled diabetes of persistently high blood sugar may lead to gradual development of various diabetic complications which include cardiovascular disease, neuropathy, nephropathy, retinopathy, stroke, skin condition, recurrent infection, and foot damage that can lead to amputation.

Type 2 diabetes is the leading cause of blindness, non-traumatic lower-limb amputation, and chronic kidney disease. Type 2 diabetes is a chronic, progressive, and

incompletely understood metabolic disease defined by the presence of chronic hyperglycemia (American Diabetes Association, 2012). It is a major cause of cardiovascular disease, leading to early death (Emerging Risk Factors Collaboration, 2010).The increasing incidence of type 2 diabetes is largely attributable to changes in lifestyle (diet and activity levels) and obesity (Centers for Disease Control and Prevention, 2011). Insulin resistance is typically present for some years before diagnosis, manifested as diminished stimulation of glucose transport in muscle and adipose tissue and inadequate suppression of glucose production in the liver in response to insulin (Faramarz, 2012).

Although glycemic control is known to reduce complications associated with diabetes, it is an elusive goal for many patients with diabetes (Deborah et al., 2013). When glycemic control is not optimized, diabetes imposes additional burdensome care requirements, health-care costs, and high risk of disabling complications, and this has been especially evident in socioeconomically disadvantaged and minority populations (Harris et al., 1999). In clinical practice, optimal glycemic control is difficult to obtain on a long-term basis because the reasons for poor glycemic control in Type 2 diabetes are complex (Wallace & Matthews, 2000). Both patient- and health care provider-related factors may contribute to poor glycemic control (Rhee et al. 2005).

Issues concerning mental health of the elderly are also alarming. Approximately 20% of the elderly experience diagnosable mental disorders (i.e., anxiety, severe cognitive impairment, and depression) that cannot be attributed to normal aging (Paula, 2007). Estimates suggest that 8–20% of community-dwelling elderly people can be diagnosed with major depression, with an aging-associated increase in depressive symptoms (Paula, 2007). It is an illness that may affect and be affected by diabetes (Paula, 2007). Depression is an independent risk factor for the onset of type 2 diabetes (Eaton et al., 1996). It negatively affects the course of diabetes and is associated with increased risk of complications (especially heart disease), hyperglycemia, and mortality (Egede, Neitert & Zheng, 2005). Thus, identifying and treating depression in diabetes is strongly recommended (Lustman & Clouse, 2004).

2.0 Medical History

2.1 Chief Complaint

Madam T was noted to have hyperglycaemia upon review for regular diabetic follow up at one of the Health Clinics in the Dictrict of Jempol, Negeri Sembilan. She was symptomless otherwise.

2.2 History of Present Illness

Upon regular blood sugar checking, Madan T was found to have a random blood sugar of 16.7mmol/L. However, the high random blood sugar could have been related to her diet prior to the blood test. Instead of being fast, patient took 4 biscuits and sugar free tea in the morning 2 hours before taking the blood glucose level. She also admitted that she have been taken 100 plus, soya bean, sweet corn and pineapples 2 days prior to check up. According to Madam T, she was never aware of a proper diabetic diet. The health care workers were unaware of this as there were communication barrier. However, no acute or chronic symptoms of uncontrolled diabetes were reported such as polyuria, polyphagia, polydipsia,

nocturia, lethargic, numbness or pain over hands, feet and legs, weight loss, blurring of vision, frequent infection, chest pain and urine changes. Home monitoring of blood sugar was never conducted since patient does not have glucometer. In view of the high random blood sugar, she was immediately given intravenous insulin at the emergency department, and was discharged once blood sugar dropped to 7.5mmol/L.

2.3 Past Medical/Surgical History

She has been diagnosed with diabetes since 13 years ago on accidental finding of hyperglycaemia during a pre- operation assessment in a private gynaecological clinic for total abdominal hysterectomy bilateral salpingo-oophorectomy. Since then, she has been attending her regular follow up at nearby health clinic. According to her, she seldom experienced hyperglycaemia. The last hypoglycaemic attack that she had was 1 year ago when she missed her meal after taking insulin. However, she has had several events related to poorly controlled diabetes such as receiving intravenous insulin for 3 months period, given on every follow up visit, developed ulcer on the right big toe associated with numbness which got worst and led to below knee amputation of the left leg 9 months ago. Apart from that, she also has hypertension for the past 12 years, and was later was also noted to have hyperlipidaemia. It was found incidentally during regular diabetes follow up.

2.4 Obstetric and Gynecological History

Her age of menarche was 13 years old and she had 6 spontaneous vaginal deliveries. After the delivering the 6th child she was on oral contraceptive pills for 1 year duration. She never has any miscarriages. She had total hysterectomy at the age of 52 years due to fibroids which presented with menorrhagia for 1 year duration.

2.5 Family History

Her mother passed away when patient's age was just 7. Thus, she is unaware of the reason of her mother's death. Her father passed away 20 years ago due to heart disease underlying hypertension. She is the second child out of 4 siblings. Her elder sister passed away due to renal failure. Another younger brother passed away due to heart failure. Two out of three siblings have diabetes mellitus. She has 6 children with no known medical illness.

2.6 Social History

Madam T is a full time housewife, a non-smoker, and does not consume alcohol. She is married and blessed with 5 sons and a daughter. She is currently lives in with her husband, daughter and a 10 year old grandson in a single storey terrace house.

2.7 Drug History

Madam T is currently on combination of oral hypoglycaemic medications such as metformin and subcutaneous insulin (Insulin comb30 100ul/ml 20 unit) for diabetes. She is also on other medications for hypertension and hyperlipidaemia and also on regular aspirin.

2.8 Relevant physical findings

Physical examination revealed a slightly high blood pressure of 158/89 mmHg, with normal heart rate (88bpm). Pedal oedema on the amputated left leg was also noted.

2.9 Clinical diagnosis

Uncontrolled type 2 diabetes mellitus with underlying hypertension and hyperlipidaemia and possible depression

2.10 Relevant investigation results

Initial random blood sugar was 16.7 mmol/L and HbA1C was 12.4%, which indicate poor diabetic control for more than 6 weeks prior to recent review. Other blood investigations were unremarkable.

2.11 Clinical Management

Following discharge from the emergency department, Madam T was advised by the doctor to comply with diabetic diet and treatment. Since she was not aware of a proper diabetic diet, she was also referred to dietician. She was also advise to continue attending the rehabilitation centre of physiotherapy in relation to her amputated left leg.

3.0 Assessment of patient's environment and lifestyle

3.1 Physical environment

Madam T and her family was living in a single storey terrace-house, located in the sub-urban area. There were narrow tarred roads connecting the house to the main road. Her front porch is fully paced with cement. The house comprises of 2 bedrooms, 1 store room, 1 living hall, 1 dining hall, 1 kitchen, 1 toilet and 1 bathroom. The house was equipped with basic needs such as clean water and electric supply. However, there was no home telephone line. The floor of her house was paced with cement where there was no mosaic or floor mat. Some part of the floor has cracks and holes due to pressure from wheelchair exerted on the uneven floor. The dining table is located at the corner of living room as a path way to allow her wheelchair to pass through. The living hall is connected directly to the kitchen and bedrooms.

The kitchen is also connected directly to the bathroom and toilet. Both bathroom and toilet are located side by side with very limited space. The floor of the bathroom was paced with cement, and was quite slippery. Patient takes bath with the aid of two plastic chairs in the bathroom in which one is used to sit while another to place her amputated left leg. There was one squatting toilet beside the bathroom.

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Figure 1 Bathroom

Meanwhile, patient's bedroom is located near the entrance of the living room and not directly connected with the bathroom. The bedroom was equipped with double-decker bed, portable toilet seat, walking frame and wheelchair. The toilet seat was used by patient especially at night time. The family has a motorcycle as their main transportation used by the husband to buy groceries. In order to go for medical follow-up, Madam T had to request one of her sons to send her by car or take a cab.

3.2 Psychological environment

Madam T is a friendly person. Rapport was easily built and maintained throughout the interview during the home visit. Our conversation was conducted in Malay and Tamil language. According to madam T, immediately after the amputation, she used to feel very sad and often cry thinking that she can no longer become independent and have to depend on others to carry out her daily routine or activities and even basic needs. However, she understood her illness and had accepted her fate.

Despite saying she has been better, she was teary, looked depressed with poor eye contact and reduce range of facial expressions. She has been making a lot of efforts to get used with the usage of wheel chair and denied any suicidal ideation when she was feeling down. She looked forward to have a prosthetic leg and able to walk again. Her husband has been taking care of her all the time since the amputation and has always been pillar of strength of each other. He took responsibility of bringing her for each and every follow up and also in monitoring her medications. On top of that, Madam T was also getting assistance form her daughter who recently moved in into her house together with her son due to some marital issues.

Madam T admitted that the family is facing financial constraints, with a monthly household income of RM700 obtained from the Social Welfare Department and also husband's pension. Her only daughter has been working since 6 months prior to the interview at a school's canteen, and was never got paid. She wakes up at 4 am every day to prepare food before she goes for work at 6.30 am. Madam T's other children were not only do not provide financial aid, but also rarely visited. Madam T seemed distressed and unhappy when talking about her children, but at the same time grateful enough that her only daughter was willing to sacrifice for her.

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3.3 Behaviour and lifestyle

After the amputation, Madam T spent most of the time staying at home. She rarely went out for sightseeing or shopping like she used to do before. This was due to the difficulty in moving around using the wheelchair. Besides, they only have a motorcycle as the main transportation. The only time she would go out is when attending the follow up at health clinic. Apart from attending the physiotherapy for her amputated left leg, Madam T never did any exercise. She also claimed to put some effort to monitor her diet intake and will only consume high sugar and salt containing foods occasionally.

4.0 Belief and understanding of illness

4.1 Belief

She believed that the illness was dietary related, especially in relation to her high intake of sugary food. She also believed that the long period of poorly controlled diet had contributed to the left leg amputation. However, she did not think it was genetically related despite having two other siblings with diabetes. Although, admitted that she did not comply to diabetic diet and medications, she has never missed her diabetes follow up because she believed regular check-up is needed to control her diabetes.

4.2 Knowledge

Despite experiencing communication barrier, Madam T has fair understanding on diabetes mellitus. She knew some symptoms of hypoglycaemic such as sweating, cold peripheries and dizziness and also symptoms of hyperglycaemic. Besides that, she was able to tell few complications of diabetes such as heart disease and neuropathy. However, she does not know that it also can lead to renal failure or blindness. She knew that she has to take the medication, however she did not know the importance of taking those medication on time.

4.3 Practice

Madam T often takes for granted the importance of taking medication on time. This probably related to her poor understanding on the related issue. All her medications were monitored by her husband and daughter. She has never administered her insulin injection by herself because she afraid of needle pricks. She only takes her medication whenever her husband or daughter is around. However, she never fails to attend each and every diabetes follow up.

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5.0 Impact of illness

5.1 Patient

5.1.1 Physical functioning

Madam T experienced massive physical impact following the left leg imputation. From highly independent person, she turned into a wheelchair bound person and required assistance from others. She could only managed simple household chores such as folding the clothes and cutting vegetables. However, with minimal assistance to set up the 2 chairs needed to take bath, she was able to bath on her own without being accompanied.

5.1.2 Psychological impact

She was very shocked and in denial state to know that she had to undergo leg amputation. She was also noted to be in reluctance. She became very depressed after the procedure and was crying frequently for a while. She became more depressed when the sons were reluctant to take responsibility on her care after the amputation. The relationship between Madam T and her husband with their sons have been good even before the amputation was conducted. She felt lonely and ignored by her own sons. Madam T tried her best to appear as positive and strong as she could in front of her husband, daughter and grandson. However they occasionally noticed her crying alone in her room without anyone's knowledge.

5.2 Family

5.2.1 Physical functioning

The family were affected by her physical limitations. Despite doing most of the house chores, the daughter has to work to earn more money for the family. Her husband was not able to find for job due to his age and also the fact that they cannot leave Madam T alone in the house.

5.2.2 Psychological impact

As caregivers of a special needs patient, the daughter and also husband are experiencing certain level of stress, but claimed coping well. It was even more stressful that other children have been ignoring them. They never showed that they were stress in front of Madam T.

6.0 Assessment of patient need

6.1 Personnel support at home

The patient surely need support from the family members at home in different aspect such as physical, financial, motivational, and psychological support. For physical support, the family members should always monitor her to take her medications. Since, she has uncontrolled diabetes and hypertension, the meal need to be prepared according to diabetic and hypertensive diet which is less sugar and less salt. Her hypertension is usually high beyond

the normal range. Thus, her stress factors such as family issues need to be reduced as much as possible. They also must observe her movement and mobility carefully to avoid her from falling. The house environment also must be cleaned, equipped with less furniture and avoid many things on the floor to facilitate her movement with the wheelchair. A continuous support not only required for Madam T, but also the caregivers (husband and daughter) coping with all the stress.

6.2 Work place

Madam T is currently unemployed. However, she worked as rubber tapper till the age of 52 just before she had the hysterectomy done.

6.3 Community care

Now she is registered as OKU (Orang Kelainan Upaya) or individual with special needs. She also received financial support from the Social Security Organization (SOCSO) of RM 400 monthly. They also received a monthly fund of RM300 from the Social Welfare Department. Madam T has also applied for prosthetic leg from SOCSO and the application is still being processed. They have serious financial issue especially to cope with the travelling expenses for medical follow up, education of the 10 year old son and also with the daily expenses.

7.0 Assessment on communication

7.1 Between patient and family members

Madam T did not have any problem communication with her family members except for with the sons. However, she hardly shared any problems or sad feelings with her husband or her daughter because that would put more burdens to them. She often kept the sad feelings to herself and sometimes cried secretly without the knowledge of others.

7.2 Between patient and health workers

As previously mentioned, patient was experiencing communication barrier with the healthcare workers since most of them were Malays. Madam T can only understand a bit of Bahasa Malaysia and English. Whenever there was Indian staff around, they could help her with the translation.

8.0 Wellness diagnosis

Uncontrolled type 2 diabetes mellitus with below knee amputation of left leg due to poor compliance to medication and diet control and probable underlying depression.

8.1 Co-morbid

Hypertension and hyperlipidaemia

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8.2 Risk factors

- Depression
- Poor understanding about compliance of medication.
- Increasing age.
- History of intake of food containing high sugar and salt level.
- Sedentary lifestyle.
- Family history of diabetes.
- Poor social and financial support

9.0 Discussion

The uncontrolled diabetes mellitus status experienced by Madam T was mainly associated to her poor compliance to medications, strict diabetic diet, her poor understanding on the importance of taking medication for diabetes and also the possible underlying depression she has been experiencing since the amputation. However, prior to the amputation her diabetic status was also poor due to her poor insight and understanding towards the illness, partly associated with the communication barriers experienced while attending the medical follow up.

Amputation of the lower limb is one of the most feared diabetic complications and is associated with loss of mobility and a poor quality of life (Schaper, Apelqvist, & Bakker, 2012). It is often preceded by poor compliance with medical care and by complications. Amputations are usually preceded by a foot ulcer and the most important factors predicting a poor outcome of these ulcers are the extent of tissue loss, infection, peripheral arterial disease (PAD) and co-morbidity (Gershater et al., 2009). The financial cost is also high for patients and their families, particularly in countries that lack a comprehensive health service and/or have a low income (Schaper, Apelqvist, & Bakker, 2012). Losing a leg frequently implies financial ruin for a whole family in these countries; therefore, a reduction in diabetes-related amputations is a major global priority (Schaper, Apelqvist, & Bakker, 2012).

Men sustain amputations more often than do women, and most such surgeries are done in those over the age of 60 years (Chaya, Lucy, & Theodore, 2007). Women who undergo amputation are usually more severely ill and have a poorer prognosis than men (Lacroix et al., 2000). The immediate reactions to the prospect of amputation vary; they depend on whether the amputation was planned, occurred within the context of a chronic medical illness, or was necessitated by the sudden onset of infection or trauma (Chaya, Lucy, & Theodore, 2007). When there is time to think about impending loss, classic stages of grief may be experienced (Kubler-Ross, 1969). After learning that amputation may be required, anxiety often alternates with depression (Chaya, Lucy, & Theodore, 2007). Depression following amputation can result from an adjustment reaction to the surgery and to sudden disability; it typically resolves with supportive treatment, involvement in rehabilitation, and the short-term use (i.e., several months) of antidepressants (Chaya, Lucy, & Theodore, 2007).

The relationship between depression and amputation may have 2 ways association. It can develop after the amputation or it can leads to amputation due to poorly controlled diabetes. According to a study conducted by Lisa et al (Lisa et al., 2011), diagnosed

depression is associated with a 33% higher risk of incident major lower limb amputation in veterans with diabetes, which indicate the worsening of diabetic control following depression which may lead to limb amputation.

For the case of Madam T, she could have experienced depressive symptoms following the amputation which precipitated by the poor relationship with hers sons and the perception that she is burdening her family members. The depressive symptoms together with her poor compliance to medications and diabetic diet had contributed to her uncontrolled diabetes. Unfortunately, the fact that she was experiencing communication barriers, the depression was never explored and detected by the healthcare workers.

10.0 Wellness Intervention

Based on this case study several wellness intervention can be proposed to improve the health status, diabetic status and quality of life of Madam T. these include:

10.1 Proper assessment of the possible underlying depression.

Throughout our interview and observation, we concluded that our patient has multiple issues which has contributed to her emotional instability and eventually resulted in depression. Her disability did gave a big impact and affect her quality of life in which her activity of daily living is affected. She was also being neglected by her 5 sons. She faced excessive guilt as she was being a burden and dependent. She was also aware of the financial problem the family faces. These multi factors have led to her non-resolving depression. This depression might be one of the reasons of persistent high level of sugar for this patient. Thus, we strongly suggest for this patient to be evaluated accordingly and necessary referral to psychiatrist or clinical psychologist. Besides patient, her family also needs to be evaluated for emotion assessment since both of her husband and daughter also part of this multi stressor. The family members also need to be emotionally stable in order to take good care of the patient.

10.2 Improving the communication between healthcare worker and the patient

In view of the poor patient's understanding on her illness especially in relation to the importance of good compliance to medications and diet due to language barrier, it is suggested that assistance from an Indian staff should be obtained during the consultation.

10.3 Education on the diabetic control and importance of compliance to medications

Madam T has lack of knowledge regarding her illness, in some aspects such as the complications of not controlling the blood sugar and hypertension, right methods of taking medications, maintaining healthy lifestyle despite her disability, and knowledge about a proper diabetic diet. She needs to be educated about the complications that might occur if her blood sugar level and blood pressure is persistently not well controlled. The family members also need to have good understanding on the illness and control of the illness. They must know symptoms of hypoglycemia, hyperglycemia, high blood pressure and diabetic complications so that they can immediately seek for management if the symptoms occur.

Emphasize on the importance of good compliance to treatment should also be given on regularly.

10.4 Education on proper diet and healthy lifestyle

Patient should also be educated about the proper diet for diabetes and hypertension. A referral to a dietician and regular review is necessary. The family members should also be educated on the preparation of meals for diabetic patients. On top of attending physiotherapy, patient should also be taught on simple exercises that can be conducted while sitting. Even moderate physical activities can contribute to the improvement of her diabetes and hypertension and also a protective factor against heart diseases.

10.6 Support group for patient and family members

Patient should be encouraged to socialize more often. Most health clinics would have the so called "program Kesihatan Wasga Emas", where she can meet up with many aged friends and involve in various activities. In view of the significant stress level experienced by the husband and daughter as caregivers, they would also benefit from counselling and support group.

10.7 Financial support

Financial problem is the main issue in this family. Despite receiving some amount of money from SOCSO and The Social Welfare Department, the total amount received is still very small. Relevant authorities or voluntary body could possibly assist in finding a proper job at convenient time for her daughter in order to enhance the household income. Apart from working outside the house she can also does certain work from home, something she may not aware of.

11.0 Conclusion

Madam T is a 66 years old Indian lady with underlying type 2 diabetes mellitus, hypertension and hyperlipidaemia, presented with uncontrolled diabetes due to poor compliance to medications and diabetic diet and also probable depression. The depressive symptoms may have precipitated by the left limb amputation conducted 9 months prior to this interview, discorded sons-mother relationship and also financial constraint. Several interventions and modifications to her current lifestyle and living condition need to be proposed in order to improve patient's medical condition and quality of life. The simplest measure would be to improve the communication barriers and exploring the depressive symptoms. Once the communication has improved health education can be done more effectively.

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