A Cross-Sectional Study of Characteristics of Diabetes Mellitus Patients in the Internal Medicine Polyclinic at Buleleng General Hospital

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Abstract: Diabetes mellitus (DM) is a metabolic disease characterized by hyperglycemia due to impaired insulin secretion, insulin action, or both. This research is a descriptive study with a cross-sectional design. Sampling was carried out by total sampling and the total sample was 242 people. Data was obtained through the patient's electronic medical record. This research was conducted on January 14-February 23 2024. The data that has been summarized is then analyzed descriptively using the SPSS Version 16 application for statistical tests. The characteristics of DM patients undergoing treatment at the internal medicine polyclinic at Buleleng General Hospital consisted of 51.6% female, 83.4% aged 41-60 years and 29.8% came from Buleleng General. Judging from the type of treatment for DM patients undergoing treatment at the internal medicine polyclinic at Buleleng General Hospital, the majority of patients underwent treatment with intensive insulin (76.8%). Currently, the most common microvascular complication encountered in patients is neuropathy (24,7%). Random blood sugar levels during treatment control at the internal medicine polyclinic were classified as good, as many as 80.2% of patients had controlled blood sugar <200 mg/dL. The conclusion of this study, based on the characteristics of type 2 DM sufferers, was that the largest age group was 41-60 years old, the largest gender was female, the most frequent complication was neuropathy. The most widely used type of DM treatment is insulin. The level of achievement of DM control based on random blood sugar levels is in good condition.

Keywords: characteristics, diabetes mellitus, microvascular complication, random blood sugar, treatment

Introduction

Diabetes mellitus (DM) is a metabolic disease characterized by hyperglycemia caused by impaired insulin secretion, insulin action or both.[1] Based on the WHO report, the incidence of DM in Indonesia will continue to increase from 8.4 million people in 2000 and to 21.3 million in 2030. This data states that Indonesia is ranked fourth in the world after India (79.4 million), China (42.3 million) and the United States (30.3 million).[2] It is estimated that 50% of DM sufferers in Indonesia

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have not been diagnosed, only two-thirds are undergoing non-pharmacological or pharmacological treatment.

According to the World Health Organization (WHO), based on all age groups, DM sufferers in the world are expected to increase from 171 million people (18.1%) in 2000 to 366 million people (4.4%) in 2030.[3] Only a third of type 2 DM sufferers who have undergone treatment have achieved the DM control criteria. Pharmacological therapy that can be given consists of OAD, namely oral medication, a combination of oral medication with insulin or intensive insulin administration. Pharmacological therapy aims to achieve blood glucose levels close to normal, prevent complications and improve the quality of life of DM sufferers.[4]

According to the United Kingdom Prospective Diabetes Study (UKPDS) research report in European and American countries, the most widely used type of oral medication is metformin, because type 2 DM in developed countries is mostly caused by obesity and insulin resistance. The results of the DPP study are based on the level of drug safety, cost (cost-effectiveness) and benefits (risk-benefit). The oral drug most commonly used in Indonesia is metformin, especially for newly diagnosed type 2 DM sufferers who are obese. Giving metformin at a dose of 850 mg twice a day reduces the risk of DM by 31%. If blood glucose levels have not reached normal, namely fasting blood glucose (GDP) > 180 mg/dl, 2 hours post prandial (PP) glucose > 250 mg/dl and A1C >8.5% metformin can be combined with glimepiride or insulin.[5,6]

Providing pharmacological therapy to DM patients is expected to achieve DM control criteria. Currently, the level of achievement of DM control in Indonesia is based on an average A1c level of 8%, which is still above the desired target of 7%. Reducing A1c levels by 1% can reduce microvascular complications by 35%. DM sufferers must have good knowledge about OADs to be able to use OADs correctly, so that they obtain maximum therapeutic results and minimal drug side effects.[7,8]

This study aims to determine the characteristics and treatment patterns of diabetes mellitus patients in the internal medicine polyclinic at Buleleng General Hospital

Materials and Methods

This research is a descriptive study with a cross-sectional design and was conducted at the Buleleng General Hospital. The sample was DM patients undergoing outpatient treatment at the Internal Medicine Polyclinic, Buleleng General Hospital. Sampling was carried out by total sampling and the total sample was 242 people with the inclusion criteria being respondents suffering from type 2 DM who had been diagnosed with DM according to PERKENI 2021. Exclusion criteria were respondents who were difficult to interview, such as respondents who were uncooperative.

Research variables consisted of sample characteristics including age, gender, DM complications, DM treatment and random blood sugar. Data was obtained through the patient's electronic medical record. This research was conducted on January 14-February 23 2024.

The data was then collected and summarized using the Microsoft Excel application. The data that has been summarized is then analyzed descriptively using the SPSS Version 16 application for statistical tests.

Result and Discussion

Table 1 explains the characteristics of DM patients undergoing treatment at the internal medicine polyclinic at Buleleng General Hospital. It was found that the patients consisted of 51.6% women and 48.4% men. In terms of age groups, the highest number of diabetes mellitus sufferers was in the 41-60 years old range at 83.4%, followed by the >60 years old group at 14.9%, and the least in the <40 years old group at 0, 8%. Based on sub-district origin, the highest number of diabetes mellitus sufferers came from Buleleng Regency at 29.8%, followed by Sukasada and Sawan sub-districts at 13.2%, while the sub-district with the lowest diabetes cases came from Banjar Regency at 3.3%.

Table 1. Characteristics of DM patients at the Internal Medicine Polyclinic, Buleleng General Hospital

Characteristics	Total (n)	Percentage (%)
Gender		
Female	125	51,6
Male	117	48,4
Age		
<40 years old	2	0,8
40-60 years old	204	84,3
>60 years old	36	14,9
Su-bdistrict		
Buleleng	72	29,8
Seririt	28	11,6
Sukasada	32	13,2
Gerokgak	20	8,3
Kubutambahan	16	6,6
Tejakula	16	6,6
Busung Biu	18	7,4
Banjar	8	3,3
Sawan	32	13,2

Table 2 explains the types of treatment for DM patients undergoing treatment at the internal medicine polyclinic at Buleleng General Hospital. Based on table 2, it was found that most patients underwent treatment with insulin (76.8%), followed by patients with oral diabetes medication (19.8%) and the least was a combination of oral antidiabetic medication and insulin (3.4%).

Table 2. Treatment profile of DM patients at the Internal Medicine Polyclinic, Buleleng General Hospital

Types of Treatment	Total (n)	Percentage (%)
Insuline intensive	186	76,8
Oral antidiabetic drug	48	19,8
Oral antidiabetic drug + Insulin	8	3,4

Table 3 explains the microvascular complications experienced by DM patients undergoing treatment at the internal medicine polyclinic at Buleleng General Hospital. Based on table 3, it was found that the most common microvascular complications were neuropathy (24.7%), followed by nephropathy complications (8.2%) and finally retinopathy (3.4%). Meanwhile, there are more DM patients without complications than those who have experienced microvascular complications, amounting to 63.7%.

Table 3. Microvascular complication of DM patients at the Internal Medicine Polyclinic, Buleleng General Hospital

Microvascular Complication	Total (n)	Percentage (%)
No complications	154	63,7
Neuropathy	60	24,7
Nephropathy	20	8,2
Retinopathy	8	3,4

Table 4 explains random blood sugar during treatment control at the internal medicine polyclinic. As many as 80.2% of patients have controlled blood sugar, but around 19.8% of patients have blood sugar.

Table 4. Microvascular complication of DM patients at the Internal Medicine Polyclinic, Buleleng General Hospital

Random Blood Sugar	Total (n)	Percentage (%)
>200 mg/dL	48	19,8
≤200 mg/dL	194	80,2

Diabetes mellitus can be controlled by living a healthy lifestyle such as diet, exercise and use of medication/insulin. Every person treating a DM patient must set targets to be achieved before starting treatment to determine the success rate of treatment and adjust therapy according to the patient's needs.[9]

The results of the study show that diabetes mellitus (DM) is more common in the age group > 40 years compared to < 40 years. DM will continue to increase with increasing age due to changes in body mass due to an increase in the amount of fat tissue and a decrease in the amount of muscle tissue and a decrease physical activity so increases the risk of developing resistance insulin.[10] The incidence of type 2 DM varies between male and female genders, but this difference is not very significant. Research conducted by Iroth in 2017 showed that those aged > 45 years had a 1.690 times greater risk of developing type II diabetes mellitus than those aged < 45 years. Increasing age is an important risk factor for diabetes mellitus in all epidemiological studies in various populations, the prevalence of diabetes mellitus shows a very specific increase according to age.[11]

The result of study also shows that DM patients undergoing DM treatment in internal medicine polyclinics are dominated by women. This is in line with research conducted by Nurayati in 2017 where diabetes mellitus was high in women. This happens because women have the hormone estrogen, which during menopause decreases and increases cholesterol levels. Cholesterol itself is one of the triggers for increasing diabetes mellitus.[12]

DM patients undergoing treatment at the internal medicine polyclinic at Buleleng General Hospital mostly use insulin, this occurs because patients have failed to achieve treatment targets with oral antidiabetic drugs. Insulin is a safe choice and can control blood sugar well.[10] This is also supported by the minimal number of microvascular complications that arise and random blood sugar that is well controlled during DM treatment.

DM treatment at the internal medicine polyclinic at Buleleng General Hospital is considered good. However, patients who still cannot achieve their therapy targets must continue to be evaluated to find out the cause, sometimes there are patients who forget to take medication or inject insulin regularly and the dose of medication or insulin given is still not sufficient.

DM is a chronic disease that will last a lifetime, so its management requires cooperation between doctors and patients, it is hoped that it can increase the patient's knowledge of their disease. This will increase patient compliance in undergoing treatment programs and towards healthy behavior. In managing DM, apart

from doctors and other medical personnel, the role of patients and families is very important. Education for patients and their families aims to provide an understanding of DM management so as to help increase family participation in efforts to improve management outcomes, especially in elderly DM sufferers.[13,14]

Conclusion

The conclusion of this study, based on the characteristics of type 2 DM sufferers, was that the largest age group was 41-60 years old, the largest gender was female, the most frequent complication was neuropathy. The most widely used type of DM treatment is insulin. The level of achievement of DM control based on random blood sugar levels is in good condition

Acknowledgements

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