

Patients' Characteristics and Initial Therapy at Diabetic Center of Sanglah General Hospital in 2018

Cokorda Istri Mas Dalem Sukawati^{1*}, I Made Jawi², Agung Wiwiek Indrayani², Desak Ketut Ernawati², Tjokorda Gde Agung Senapathi^{3*}, Christopher Ryalino³, Made Pande Dwipayana⁴

¹. Undergraduate Student, Faculty of Medicine, Udayana University, Bali, Indonesia.

². Department of Pharmacology and Therapy, Faculty of Medicine, Udayana University, Bali, Indonesia.

³. Department of Anesthesiology and Intensive Care, Faculty of Medicine, Udayana University, Bali, Indonesia.

⁴. Department of Internal Medicine Faculty of Medicine, Udayana University, Bali, Indonesia.

***Corresponding Author: Tjokorda Gde Agung Senapathi**

Abstract

Background: Diabetes mellitus (DM) is a chronic disease that requires medical treatment and education to prevent acute or chronic complications. Until today, there have been no published records in the incidence of DM in Bali. The goal of this study was to observe the characteristics of patients who visited Diabetic Center of Sanglah General Hospital in 2018. **Methods:** This was a cross-sectional, retrospective study. The subjects of this study were all patients newly-diagnosed with DM, aged 18 or older, who came to the Diabetic Center of Sanglah General Hospital. The sampling method was all-inclusive sampling. We recorded the age, sex, body height, body weight, body mass index (IMT), baseline fasting blood sugar, and baseline HbA1C. The data were analyzed descriptively. **Results:** In 2018, 1,145 patients visited the Diabetic Center of Sanglah General Hospital. The majority of the subjects were men (66.11%), with the most frequent age-group was the 50-69 years age group (69.08%). As many as 117 patients received OADs as initial therapy, while 840 received insulin, and the remaining 665 received a combination of both OAD and insulin. **Conclusions:** There were 1,145 patients visited the Diabetic Center of Sanglah Hospital in 2018, with the highest age-group was the 50-69 years age group. Only a small number of them received OADs as initial therapy, and most of received the combination of insulin and OADs.

Keywords: *Diabetes mellitus, Age, Sex, Bali, Indonesia.*

Introduction

Diabetes mellitus (DM) is a set of physiological dysfunctions characterized by hyperglycemia due to insulin resistance, lack of insulin secretion, or excess of glucagon secretion [1]. Diabetes mellitus type 2 (T2DM) occurs more frequently than Diabetes mellitus type 1 (T1DM). In T2DM, there is a combination of pancreatic beta-cell dysfunction and insulin resistance resulting in the progressive weakening of glucose regulation. Reports suggest that the prevalence and incidence of T2DM tend to increase worldwide [2, 4]. According to the World Health Organization (WHO), there were 422 million people aged 18 years or older, experiencing DM worldwide in 2014 [5,

6]. The incidence of DM has increased over the past two decades due to increasing population numbers, increasing life expectancy, and earlier onset of DM. According to the International Diabetes Federation (IDF), there will be an increase in the number of people with DM from 9.1 million to 14.1 million from 2014 to 2035 in Indonesia alone [4, 7]. The treatment of DM includes education, nutrition, exercises, and pharmacological treatment [8, 9]. Oral anti-diabetic drugs (OAD) includes sulfonylureas (glipizide, glyburide, gliclazide, glimepiride), meglitinides (repaglinide and nateglinide), biguanides (metformin), thiazolidinediones (rosiglitazone, pioglitazone), α -glucosidase

inhibitors (acarbose, miglitol, voglibose), DPP-4 inhibitors (sitagliptin, saxagliptin, vildagliptin, linagliptin, alogliptin), SGLT2 inhibitors (dapagliflozin and canagliflozin), and cycloset (bromocriptine) [8]. Another pharmacological treatment for DM is insulin. There are mainly three classifications of insulin: short-acting, intermediate-acting, and long-acting [1, 10]. Insulin is an endogenous hormone, which is produced by the pancreas. Both diabetes mellitus type 1 and diabetes mellitus type 2 are marked by a loss of pancreatic function, though to differing degrees [11, 12].

People who have either type of diabetes are at risk for severe hypoglycemia, with potentially severe consequences to the heart and brain. Many people require insulin therapy to manage their blood sugar levels and keep them within a target range. Sanglah General Hospital as the main hospital for the eastern Indonesia region erected Diabetic Center recently. It is an outpatient unit specially designed to provide medical care for diabetic patients. The goal of this study was to observe the characteristics of patients who visited Diabetic Center of Sanglah General Hospital in 2018.

Materials and Methods

This was a cross-sectional, retrospective study that was carried out in 2019. The subjects of this study were all patients aged 18 or older who visited the Diabetic Center of Sanglah General Hospital. The sampling method was all-inclusive sampling. The data sources of this study were the medical records of the Diabetic Center patients of Sanglah General Hospital. We recorded the age, sex, body height, body weight, body mass index (IMT), systolic and diastolic blood pressure upon the first diagnosis of DM, baseline fasting blood sugar, and baseline HbA1C. The data were analyzed descriptively using Statistical Package for Social Sciences (SPSS) version 24 (IBM Corp. Released 2016. IBM SPSS Statistics for Windows, Version 24.0. Armonk, NY: IBM Corp.).

Results

In 2018, 1,145 patients visited the Diabetic Center of Sanglah General Hospital. The characteristics of the subjects can be seen in Table 1. The subjects were dominated by men (66.11%); with the most frequent age-group was the 50-69 years age group (69.08%).

Table 1: Patients visiting the Diabetic Center of Sanglah General Hospital in 2018

Variables	N = 1.145
Sex	
Male, n (%)	757 (66.11)
Female, n (%)	388 (33.89)
Age-groups (years)	
18-29, n (%)	5 (0.44)
30-39, n (%)	34 (2.97)
40-49, n (%)	124 (10.83)
50-59, n (%)	404 (35.28)
60-69, n (%)	387 (33.80)
70-79, n (%)	172 (15.02)
≥80, n (%)	19 (1.66)
Body weight (kg), mean± SD	68.2±14.6
Body height (m), mean± SD	1.67±0.21
Body mass index (kg/m ²), mean± SD	25.7±3.6
Blood sugar level (mg/dL), mean± SD	207.98±97.63
HbA1C level (%), median (min-max)	7.7 (4.3-9.9)

Out of the 1,145, 117 (10%) patients received OADs (Figure 1). The number of patients who received insulin was 840 patients (161 patients received short-term insulin therapy,

14 patients received long-term insulin therapy, and the remaining 665 patients received a combination of both). We found no

consistent record of the occurrence of drug side effects such as weight gain and the

incidence of hypoglycemia in the medical records.

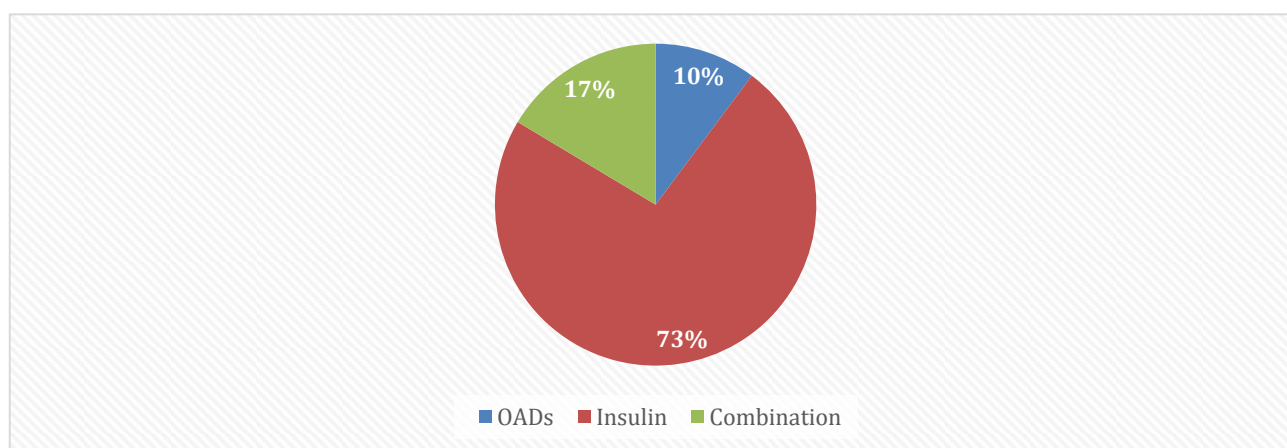


Figure 1: Distribution of diabetes therapy in newly-diagnosed DM at the Diabetic Center of Sanglah General Hospital in 2018

Discussion

Diabetes mellitus is a chronic metabolic disorder that is better known as a silent killer [13, 15]. Often one does not realize if one has diabetes, which may play a role in why one usually seeks medical help only when complications occur. Indonesia ranked 5th in the world in terms of DM patients in 2014. According to the Indonesian Ministry of Health, 3 million Indonesian people were living with DM in Bali in 2013 [14]. So far, there has not been a published report on how many people living with DM are in Bali.

In 2018, patient visits at the Diabetic Center of Sanglah General Hospital were dominated by men (66.11%); with the most age-group was the 50-69 years age-group (69.08%). This is consistent with the existing theory that T2DM is a degenerative disease that the incidence begins to increase at the age of 40 years [16, 17]. The incidence of T2DM in women is generally higher than in men. Women are more at risk of developing diabetes because physically, they have a higher chance of increased BMIs [18].

The total population of Bali in 2018 was reported to be 3,890,757 people. According to the Indonesian Ministry of Health in 2018, the prevalence of people living with DM in Bali was 1.7% [14]. This means that the estimated number of people with DM in Bali is 66,143 people. The number of new patients visiting the Sanglah General Hospital Diabetes Clinic in 2018 was 1,145 people, but it should be remembered that Sanglah

General Hospital is only one of many places that serve health services for T2DM patients in Denpasar, let alone in Bali. The mean baseline blood sugar for the subjects was 207.98 ± 97.63 mg/dL, with a median baseline for HbA1C level was 7.7%.

This number can be considered poor if we consider that the current target for HbA1C level is <7% [19]. We originally wanted to evaluate the alteration of the HbA1C levels in each patients but it was not possible to do because of the lack of recording and filing in the medical record. Besides, the time-frame for the second HbA1C level test differed for each patient. Education, nutritional therapy, physical exercises, and pharmacological treatment are the four milestones in the treatment of DM.

Each plays its own role, and each role is directed to achieve and promote the prevention and treatment of DM. Unfortunately, we found no consistent data in the medical records that explain how education, nutrition, and physical exercises are promoted to the patients. Of the 1,145 patients, 840 (73%) received insulin therapy. In detail, 161 (14.06%) received short-acting insulin, 14 (1.22%) received long-term insulin, and 665 (58.08%) received a combination of both. A total of 117 patients (10.22%) received OAD, of which 90 patients (7.86%) received metformin as monotherapy.

The remaining 188 patients (16.42%) received combination therapy between insulin and OAD. The pancreas produces

insulin. Diabetes patients do not have the ability to take and use blood sugar, so blood sugar levels increase. In T2DM, the patient's body produces insulin, but the cells do not respond normally to insulin. However, insulin is also used in T2DM to overcome cell resistance to insulin. With increasing glucose uptake by cells and decreasing blood sugar levels, it will prevent and reduce further complications from diabetes. The choice of the type of insulin therapy depends on several factors, like individual response to insulin, lifestyle, age, and the target of blood sugar regulation [20, 21].

The most OAD given to the subjects of this study was metformin (7.86%). Metformin is one of the biguanide drugs. This drug has the main effect of reducing liver glucose production (gluconeogenesis), while also improving peripheral glucose uptake. Metformin is contraindicated in patients with impaired renal function (serum creatinine >1.5 mg/dL) and liver, as well as patients

with a tendency to hypoxemia (e.g., cerebrovascular disease, sepsis, shock, heart failure) [22]. Metformin may cause nausea as one of its side effects. To reduce this, it is usually given during or after meals. In addition, it must be noted that the administration of metformin by titration dose at the beginning of use will make it easier for doctors to monitor the side effects of these drugs. However, we could not find any records about the side effects of OADs at the medical records.

Conclusion

The visit of newly-diagnosed DM patients Diabetic Center of Sanglah Hospital in 2018 was 1,145 cases, with the highest age-group was the 50-69 years age group. Of the 1,145 patients, 840 (73%) received insulin therapy, 117 (10.22%) received OADs, and 188 (16.42%) received combination therapy between insulin and OAD.

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