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Prediabetes and Diabetes Alert : Check Your Blood Glucose

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Abstrak

Faktor risiko prediabetes dan diabetes melitus tipe 2 diketahui dan mudah dinilai. Terdapat serangkaian bukti yang kuat mengenai manfaat identifikasi dini dan intervensi terhadap pradiabetes dan diabetes. Penelitian ini bertujuan untuk mengetahui karakteristik penderita prediabetes dan diabetes mellitus tipe 2 di Puskesmas Depok, Jawa Barat. Karakteristik penelitian adalah usia, jenis kelamin, gangguan glukosa puasa, dan gangguan toleransi glukosa. Desain penelitian menggunakan penelitian deskriptif. Populasi penelitian ialah seluruh penderita diabetes melitus yang ada di Puskesmas Depok, Jawa Barat. Sampel penelitian ini adalah masyarakat yang memeriksakan glukosa darah pada bulan Januari 2020 sampai April 2021 di Puskesmas sebanyak 238 pasien. Teknik pengambilan sampelnya adalah dengan menggunakan non-random sampling. Hasil penelitian menunjukkan umur diatas 55 tahun 55,5%, berjenis kelamin perempuan 67,2%, berdasarkan gangguan glukosa puasa 42,8% dengan diabetes melitus tipe 2 dan 32,4% dengan prediabetes, berdasarkan gangguan toleransi glukosa 27,3% dengan diabetes mellitus tipe 2 dan 11,8% dengan pradiabetes. Kesimpulan populasi penelitian adalah seluruh penderita prediabetes dan diabetes melitus di Puskesmas Depok, Jawa Barat, berusia di atas 55 tahun, berjenis kelamin perempuan, IFG, dan IGT.

Abstract

The risk factors for prediabetes and type 2 diabetes mellitus (T2DM) are known and simple to assess. A strong chain of evidence exists for the benefits of early identification of and intervention on prediabetes and diabetes. This study aimed to determine the characteristics of patients with prediabetes and T2DM in public health center, Depok, West Java. The study's characteristics were age, sex, impaired fasting glucose (IFG), and impaired glucose tolerance (IGT). The study design uses descriptive studies. The study population was all people with diabetes mellitus is one in the public health center, Depok, West Java. This study sample was people who checking blood glucose in January 2020 to April 2021 in the public health centers, 238 patients. The sampling technique is by using non-random sampling. The results showed that people aged over 55 years 55.5%, female sex 67.2%, based on IFG 42.8% with type 2 diabetes mellitus and 32.4% with prediabetes, based on IGT 27.3% with T2DM and 11.8% with prediabetes. The study population's conclusions were all people with prediabetes and diabetes mellitus in the public health center, Depok, West Java, aged over 55 years, female sex, IFG, and IGT.

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INTRODUCTION

About 425 million individuals throughout the world have type 2 diabetes mellitus, with 75% residing in nations with low or medium incomes. This is a huge concern for public health. Type 2 diabetes has far-reaching societal and healthcare systemic consequences, with yearly expenses in the trillions of dollars. Effective and cost-effective methods addressing both high-risk people and the broader community are urgently needed to curb the diabetes epidemic (Sathish, 2019).

There is mounting evidence from observational and epidemiologic studies linking diabetes to higher rates of death, illness, and healthcare expenditures. There are a number of physician and health-system issues that may contribute to the underutilization of diabetes prevention interventions. There is a schism in the present prediabetes practice that mirrors the prevailing view on the meaning of diabetes preventive study results (Carris et al., 2019).

Insulin resistance (reduced tissue sensitivity to insulin) and insulin secretory abnormalities (pancreatic beta cell malfunction) describe the transition from normal glucose tolerance to type 2 diabetes. A increase in postprandial glucose levels caused by impaired first-phase insulin production is the first glucose anomaly that is noticed. Fasting glucose levels rise as beta-cell function continues to deteriorate with age. More insulin secretory loss leads to diabetes in the long run (Attia et al., 2013).

Prediabetes and type 2 diabetes risk factors are well-documented and easy to evaluate. The advantages of detecting prediabetes and diabetes early and intervening on them are supported by a significant body of research. It is well-established that treatments aimed at preventing type 2 diabetes, whether through primary or secondary prevention, improve the health of those at risk for and living with the disease. Now is the moment to reject “see-no-evil” guidelines that discourage screening those who are at risk for serious, curable diseases (Kirkman, 2013).

A higher risk of type 2 diabetes and macrovascular events with negative consequences is associated with prediabetes, which is common in people with macrovascular disease. Thus, prediabetes may emerge as a potent treatment target for primary and secondary preventive efforts. Reducing the likelihood of becoming type 2 diabetes and macrovascular disease is possible with both antidiabetic medication and behavioral changes. As a component of secondary prevention, further research is needed to determine the efficacy of treating prediabetes in individuals who already have macrovascular illnesses (Kleinherenbrink et al., 2018).

Changes in the definition of prediabetes and other demographic factors affect the pace at which people

go from prediabetes to diabetes. From prediabetes to diabetes: a meta-analysis published in 2007, the yearly incidence rates were as follows: 4%-6% for isolated IGT, 6%-9% for isolated IFG, and 15%-19% for both IGT and IFG combined (Bansal, 2015).

Although there may be overlap between IFG and IGT, these groupings reflect distinct pathophysiologic processes. While there are some differences between IFG and IGT, both tests are helpful in diagnosing dysglycemic disorders. However, the Fasting Plasma Glucose (FPG) level alone is not always enough to diagnose IGT, and the 2-hour post-glucose load is not always a reliable predictor of IFG. Prediabetes was once used to describe patients with IFG and/or IGT who had a new disease. For the diagnosis of diabetes and prediabetes, the American Diabetes Association (ADA) recommended FPG due to its cheap cost, patient acceptance, and convenience of use. Patients with IFG or those whose suspicion of diabetes persists despite a normal fasting plasma glucose (FPG) level may necessitate an oral glucose tolerance test (OGTT). Although the WHO agreed with most of these findings, they did add that those with IFG should additionally have an OGTT to rule out diabetes or IGT (Buysschaert & Bergman, 2011).

The following are the diagnostic criteria for type 2 diabetes, insulin-dependent GF, and IGT. Diagnosed with IFG when fasting plasma glucose levels range from 100 mg/dL (5.6 mmol/L) to 125 mg/dL (6.9 mmol/L) [1]. If the 2-hour plasma glucose ranges from 140 mg/dL (7.8 mmol/L) to 199 mg/dL (11 mmol/L) during an oral glucose tolerance test, it is used to diagnose IGT. The symptoms of diabetes, including polydipsia, polyphagia, polyuria, and unexplained weight loss, along with a random glucose level of 200 mg/dL (11.1 mmol/L), fasting plasma glucose of 126 mg/dL, or 2-hour plasma glucose level of 200 mg/dL (11.1 mmol/L) during an oral glucose tolerance test using a glucose load containing 75 g of anhydrous glucose dissolved in water, are considered diagnostic criteria for diabetes (Berry & Melkus, 2006).

We found that having a regular health care provider and other forms of access to health services considerably affect prediabetes awareness. According to our findings, those without access to health care may not be able to follow the guidelines made by the Centers for Disease Control and Prevention (CDC) regarding prediabetes screening. Findings from this study emphasize the importance of public health policies and initiatives that expand people's ability to get medical treatment, with a focus on making sure that every American has a regular spot to go for their checkups. Consequently, this has the potential to raise awareness of prediabetes, encourage people to engage in actions that reduce the risk of diabetes, and start reversing the rising diabetes

incidence rates (Campbell et al., 2016).

METHOD

The location of the study was conducted is one of the public health centers, Depok, West Java on June 2021. The study design used in this study was a descriptive, a study conducted with the aim of know the blood glucose for prediabetes and T2DM. The population of this study was patients who check blood glucose in Public Health Center, Depok, West Java. The sample of this study were people who checking blood glucose for prediabetes and T2DM alert from January 2020 to April 2021, there were 238 respondents in the public health center, Depok, West Java. Patients' traits who were monitored for prediabetes and type 2 diabetes alert were the factors utilized in this research. Secondary data for this study came from the Depok, West Java public health center's patient records. Full demographic details, including age, gender, and blood sugar levels, are available in medical data collected from public health institutions. The medical data gathered beginning in the year 2020. After that, we'll use SPSS version 22 to add quantitative data into a database and look at the distribution of respondent attributes.

RESULT AND DISCUSSION

Secondary data collected from the public health center's medical records between July 21 and July 28, 2021, constitutes the processed data. Patients at the public health facility in Depok, West Java, who checked their blood glucose levels between 2020 and 2021 made up the study's population. Characteristics, age, sex, and blood glucose levels were all appropriately represented in the collected data. The results showed that of the patients from the age, 55.5% were between more than 55 years old (132 patients), 20.6% were between 45 to 54 (49 patients), 8.8% were between less than 44 years old (21 patients), and 15.1% were missing. Based on the gender showed that patients, 67.2% were female (160 patients) and 32.8% male (78 patients). Based on impaired fasting glucose that patients, 42.8% with type 2 diabetes (102 patients), 32.4% with prediabetes (77 patients), and 24.8% had normal blood glucose (59 patients). Based on impaired glucose tolerance that patients, 27.3% with type 2 diabetes (65 patients), 11.8% with prediabetes (28 patients), 8.4% had normal blood glucose (20 patients), and 52.5% didn’t do check the impaired glucose tolerance.

The symptoms of prediabetes may also vary by gender, according to several research. Both IFG and IGT are more common in females than in males. The disparity's cause remains obscure. On the other hand, women may have a higher rate of insulin-stimulated glucose elimination due to their lesser muscle mass or lack of physical fitness. As we become older, our chances of developing prediabetes also rise. This might be because

insulin secretion naturally declines with age, a process that could be hastened by heredity (Mahat et al., 2019).

Another study found that 16.7% of adults in Qatar had diabetes mellitus, with 10.7% having diagnosed type 2 diabetes and 5.9% having just been diagnosed. In all, 13.8% of patients were found to have impaired fasting glucose and 12.5% to have IGT. The prevalence of type 2 diabetes mellitus peaked in the 40-49 age range (31.2%) and was greater in women (53.2%) compared to males (46.8%). Both overall type 2 diabetes and insulin resistance were more common as people became older (Bener et al., 2009).

Researchers in Iran found that among adults aged 45–69 living in urban areas, 23.89 percent had diabetes, with a 13.73 percent 5-year incidence rate. An additional risk factor for diabetes included being overweight or obese, as well as having high blood pressure. It is critical to develop and execute quick interventions to decrease the prevalence of diabetes and its complications in light of the rising tide of diabetes among the elderly and the country's aging population (Ebrahimi et al., 2016). In a different research, it was shown that 23% of patients had prediabetes, which can be defined as impaired fasting glucose, impaired glucose tolerance, or combination of the two. All patients had an average age of 52.35 ±7.02 years. Prediabetes was present in 26.33 percent of female patients and 21.43 percent of male patients (Attia et al., 2013).

The study found 237 new occurrences of diabetes after a median follow-up of 6 years. This corresponds to a cumulative incidence of 6.4% (95%CI: 5.6-7.2) and an incidence rate of 10.6 (9.2-12.1) per 1000 person-years, when we take into account both age and sex. Every year, Type 2 diabetes affects around 1% of urban Iranians over the age of 20. Among the modifiable risk variables for incident diabetes, the combination of IFG and IGT was the greatest predictor (Harati et al., 2009). Among the patients diagnosed with type 2 diabetes mellitus at the Regional Hospital in East Jakarta, the following characteristics were found: 86% were over the age of 45, 52% were male, 78.82% had a bachelor's degree or above, 55% were employed, 48% had a normal body mass index (BMI), 54% had a family history of type 2 diabetes mellitus, 57% had hypertension in their family history, and 65% had normal blood pressure. In order to enhance the patient's quality of life and avoid the development of type 2 diabetes, early detection of the disease's symptoms is essential (Mutika et al., 2021).

A total of 84 people (11.5%) became diabetic out of 732 people who took part in the study (mean age: 43 years; 65% female; 71% nonwhite). Obese persons were more likely to develop prediabetes and type 2 diabetes mellitus if they had insulin resistance and excess visceral fat rather than if they had excess overall adiposity (Neeland et al., 2012).

Among Vietnamese adults, 1 in 17 had diabetes and 1 in 7 had prediabetes. Diabetes is on the rise due to factors such as a more urbanized population, an older population, higher blood pressure, obesity, and sedentary jobs (Pham & Eggleston, 2016). Out of the 1,189 people who took part, 114 had type 2 diabetes (9.6%), 330 had prediabetes (27.8%), and 745 did not have diabetes or pre diabetes (62.7%). Findings from the study reveal a high incidence of type 2 diabetes and prediabetes in the Czech population ranging from 25 to 64 years old, along with information on the risk factors associated with these conditions (Brož et al., 2020). Among the people surveyed, 1.3% had IFG, 2.0% had IGT, and 7.0% had type 2 diabetes. Women had a higher prevalence of IFG, IGT, and IFG + IGT. A higher degree of glucose intolerance was positively correlated with older age (Rahim et al., 2009).

Diet and exercise modifications can be implemented generally or targeted at people with a higher risk of diabetes, as determined by factors like a family history of the disease or clinical findings like central obesity. In the future, metabolic profiling might be used to identify those who are more likely to develop metabolic diabetes due to insulin resistance or reduced b-cell activity. The results of this study could help guide treatment plans that target the specific metabolic imbalances (Fujimoto et al., 2000).

CONCLUSION

Patients with type 2 diabetes mellitus and prediabetes had the characteristic who 55.5% were between more than 55 years old (132 patients), 67.2% were female (160 patients). Based on impaired fasting glucose that patients, 42.8% with type 2 diabetes (102 patients), 32.4% with prediabetes (77 patients) and based on impaired glucose tolerance that patients, 27.3% with type 2 diabetes (65 patients), 11.8% with prediabetes (28 patients). To enhance the patient's quality of life and avoid the onset of the illness, early identification of prediabetes and type 2 diabetes is essential.

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