Blood Glucose Levels of Prediabetic Employees

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ABSTRACT

Prediabetes is a state of increasing a person's blood glucose level before entering the Diabetus Mellitus (DM) category. Untreated prediabetes, within 3-5 years can change to DM type 2. Prediabetes blood sugar levels in fasting conditions 100-125 mg/dL or 2 hours after eating 140-199 mg/dL. This study aims to find out the characteristic of blood glucose levels in cases of prediabetes. This research used descriptive survey with cross sectional approach. The subjects of this study were STIKES Al Irsyad Al islamiyyah Cilacap employees. A sample of 30 respondents were taken with purposive sample. Data analysis uses univariate analysis. The results of this study indicate that most male gender is 22 (73.3%) and female 8 (26.7%). The average/ mean age of respondents is 36.3 years (age min-max: 23-49 years); body weight (BW) 67.1 Kg (BW min-max: 53-81 Kg); body height (BH) 166 cm (BH min-max: 150-179 cm); with blood glucose levels 122.5 mg/dL (min-max blood glucose levels: 110-155 mg/dL). This study provides recommendations that can be followed up by giving intervention so that the case of prediabetes doesn't become type 2 DM.

Keywords: Prediabetes, Disbetus Mellitus, level of blood glucose employees

1. Introduction

Prediabetes is a medical term referring to blood glucose levels above the normal range but not high enough to be called diabetes mellitus - the level between normal and diabetes. Prediabetes is now recognized as a reversible condition that increases an individual's risk for development of diabetes. Lifestyle risk factors for prediabetes include overweight and physical inactivity (Tuso, 2015).

Development of prediabetes to diabetes occurs 3 years later without lifestyle modification (Mayans, 2015). Within 3-5 years, 25% of prediabetes can develop into Type 2 DM, 50% remain in prediabetes, and 25% return to normal blood glucose conditions (Bansal, N., 2012).

The prevalence of diabetes in the world is growing rapidly with the number of projections increasing from 171 million in 2000 to 366 million in 2030. More than 100 million U.S. adults are now living with diabetes or prediabetes. The report finds that as of 2015, 30.3 million Americans – 9.4 percent of the U.S. population –have diabetes. Another 84.1 million have prediabetes, a condition that if not treated often leads to type 2 diabetes within five years (CDC Newsroom, 2017). The prevalence of prediabetes in Indonesia is estimated to be around 30 million Indonesians in the condition of prediabetes (Elliza & Sofitri, 2012). Predictions from 33 provinces in Indonesia have 10% of the population in Indonesia in prediabetes in 2011 (Soewondo & Pramono (2012). In Central Java Province, the highest number of DM cases is in Cilacap Regency (3.9%), followed by Tegal City District (3.1%), Surakarta (2.8%), and Pemalang (2.1%) (Riskesda, 2007).

The condition of prediabetes can increase the risk of atherosclerosis due to endothelial damage to blood vessels due to increased blood sugar and can increase the risk of diabetes mellitus, heart disease and other Macrovascular diseases (Ciccone, et al, 2014). Prediabetes is a risk factor for cardiovascular disease. In addition, prediabetes generally has other cardiovascular risk factors such as obesity, hypertension, and dyslipidemia (Chiasson & Bernard, 2011). The study conducted by AusDiab, Framingham, the Diabetes Reduction Assessment with ramipril and rosiglitazone Medication (DREAM), and the Study of Prevent Non-Insulin Dependent Diabetes Mellitus (STOP-NIDDM) found that the risk of cardiovascular events was twice as high in prediabetes compared to individuals with blood glucose normal (Soewondo & Pramono, 2011).

2. Prediabetes

a. Prediabetes is a medical term referring to blood glucose levels above the normal range but not high enough to be called diabetes mellitus - the level between normal and diabetes. Individuals who have high levels of prediabetes glucose values for future type 2 diabetes (Wikipedia, 2017).

Prediabetes consisting of Impaired Fasting Glucose (IFG) and Impaired Glucose Tolerance (IGT) is a condition before diabetes mellitus where fasting blood sugar levels are between 110-125mg / dl, and blood sugar levels 2 hours after loading 75 g glucose in the test Oral Glucose Tolerance (OGTT) is 140-199mg / dl. (Prediabetes. January 2008. http://www.mayoclinic.com).

b. There are no symptoms that are typical for prediabetes and most do not cause symptoms. Some people with prediabetes can experience some symptoms of diabetes, such as: weight loss without cause or weight gain, increased appetite, frequent urination, fatigue, opaque eyes, wounds that are difficult to heal, tingling, recurrent infections (skin, genital infections or ureter (http://www.kerjanya.net)

c. Type II diabetes is a combination of two conditions namely insulin resistance and beta cell insufficiency. Insulin resistance will cause hyperglycemia and hyperinsulinemia. Continuous hyperglycemia will stimulate beta cells to produce excessive amounts of insulin as compensation for insulin resistance. But if the beta cells are not strong enough to compensate for this process, there will be a disturbance in glucose tolerance which if not overcome, diabetes mellitus will occur. All type II diabetes mellitus is preceded by impaired glucose tolerance, so this condition is also called prediabetics (Documents Study of DPP. Http: //www.aboutdpp.htmlv.doc).

Prediabetes is related to the body's ability to process glucose in the body. Glucose that enters the body through food, especially those containing carbohydrates, is processed into an energy source for the body's cells with the help of the hormone insulin. Insulin helps keep the amount of sugar normal so there is no accumulation of sugar in the bloodstream. Prediabates occur when the glucose treatment process does not go well, such as when the pancreas gland does not produce enough insulin or in insulin resistance conditions

Prediabetes sufferers cannot process glucose properly so that there is a buildup of glucose in the blood and cannot be channeled to the tissue as it should. The exact cause of prediabetes is unknown. There are several risk factors that increase the likelihood of a person suffering from prediabetes, including: obesity, lack of physical activity, age, family history, lack of sleep, history of diabetes in pregnancy, and polycystic ovary syndrome. The exact cause of prediabetes is unknown. However, genetic factors and family history play an important role in the occurrence of prediabates.

d. Understanding blood glucose or blood sugar levels is a term that refers to the level of glucose in the blood. Under normal circumstances, fasting blood glucose levels are <100 mg / dL, and 2 hours after eating <140 mg / dL. As for diabetes, fasting glucose levels are ≥ 126 mg / dL and 2 hours after eating ≥ 200 mg / dL. So, prediabetes is located between the two conditions namely fasting 100 - 125 mg / dL IFG (impaired fasting sugar glucose) and 2 hours after eating 140 - 199 mg / dL. Based on research, the risk of IGT (impaired glucose tolerance- sugar tolerance is impaired) to become diabetic is greater than IFG.

3. Data and Method

This study used descriptive survey with cross sectional approach. The population 109 and 30 samples with purposive sample. Instrument used questionnaire for characteristic sample. Collecting data of glucose level use check blood glucose levels. Data Analysis using univariate analysis.

4. Results

The results are: sex of respondent that female 8 (27%) and male 22 (73%).
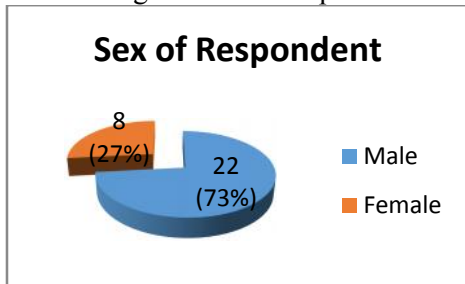
Fig. 4.1 sex of respondent

Table 4.1 *Characteristics of Respondent*

Characteristics	n	mean	Min-max
Ages	30	*36.3 years*	*23-49 years*
Body Weight (BW)	30	*67.1 Kg*	*53-81 Kg*
Body Height (BH	30	*166 cm*	*150-179 cm*
Body Mass index	30	*24,46*	*18,8-31,6*

Table 4.2 blood glucose level

Blood Glucose Level	n	mean	Min-max
IFG	30	*114,8*	*100-125*
IGT	30	*151,1*	*140-172*

5. Discussion

a. Sex of respondent

Male gender has a risk of developing type 2 DM compared to women (Geer & Shen, 2009) and the results showed differences in the proportion of sex in prediabetes where men (29.3%) were higher than female (20%) (Deyasningrum & Utari, 2014). According to Dany, et al. (2017) stated that men are more at risk of experiencing i-IFG than women. The adult population in the world who suffer from metabolic syndrome based on the International Diabetes Federation (IDF) is 20-25%, namely 8-24.2% in the male population and 7-46.5% in the female population (Rahmawati, Djamiatun & Suci, 2017).

b. Ages

The proportion of prediabetes increases at age 30, and blood glucose levels increase from > 30 years , research 36-55 years (Wulandari & Wirawanni, 2014). Dany etc (2013) dominant risk factor ages ≥ 30 years. Deyasningrum and Utari (2014) about the dominant factors for the incidence of pre diabetes mellitus at the age of < 45 years.

c. Body Mass Index

Laaksonen et al. (2010) and Trisnawati, et.al. (2013) the strongest factor causing type 2 DM is someone with a BMI > 25 kg / m2. The results of the research by Deyasningrum and Utari (2014) showed that respondents who included prediabetes had maximum BMI > 31,6 kg/m2 or classified as obese/overweight.

d. Blood Glucose Level

Prediabates is located between normal glucose levels and diabetes; during fasting conditions of 100-125 mg / dL (IFG) and 2 hours after eating 140-199 mg / dL (IGT) (Auliya, Oenzil & Rofinda, 2016; Manaf; Wulandari & Wirawanni, 2014).

6. **Conclusion**: implications for education policy and future reasearch. Sex: male (73%), Ages: mean 36.3 years, BMI= 24.46 and IFG= mean 114.8 mg/ dL and IGT= mean 151.1 mg/ dL This study provides recommendations: Physical exercise program; Diet: Yogurt and Improve to education*,* that can be followed up by giving intervention so that the case of prediabetes does not become type 2 diabetes mellitus.

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