



The association of blood glucose levels with positive protein urine in diabetes melitus patiens

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Abstract: Diabetes mellitus is a group metabolic disease characterized by hyperglycemia that was resulting from insulin secretion abnormality, insulin action or both. Indonesia is occupy ranked fifth of the highest diabetes in the world. In patient diabetes mellitus with Chronic hyperglycemic contributing to the emergence of various complications. One of them is nephropatic diabetic that can cause kidney failure. Proteinuria is a marker of decline in renal physiology dan function of endothelial. The aim of this study was to determine the relationship between blood glucose and urine protein on diabetes mellitus patients. This research method used analytic descriptive with cross sectional approach using primary data that involve 25 respondent patients of diabetes mellitus in Jemursari Islamic Hospital Surabaya who will be checked their blood glucose levels and urine protein levels. Based on result of the research shows that the mean of blood glucose levels is 256,84 mg/dL, and the mean of urine protein levels is 108,00 mg/dl. The result of the analysis using pearson’s correlation shows that there is no substantial correlation between blood glucose level and urine protein levels of suffering diabetes mellitus in Jemursari Islamic Hospital Surabaya with value $(\rho) > (\alpha) = 0,418$.

Keywords: Diabetes mellitus, Blood Glucose, Protein Urine, Nephropathy diabetic

1. Introduction

Diabetes mellitus (DM) or commonly known as “kencing manis” is group metabolic disease characterized in a person caused by an increase in insulin levels which increases progressive insulin secretion against the background of insulin resistance (1). According to the American Diabetes Association (2), DM is a group of metabolic diseases characterized by hyperglycemia that occurs due to abnormal insulin secretion, insulin action, or combined of both (3).

According to the RISKESDAS, the national prevalence of DM in Indonesia for ages above 15 years is 5.7% (4). Based on IDF 2014 data, currently an estimated 9.1 million people are diagnosed as people with diabetes. With this figure, Indonesia increased its fifth rank in the world, or rise two ranks compared to IDF data which rise to rank seventh in the world with 7.6 million people who received DM (5). Diabetes mellitus can be the cause of various diseases such as hypertension, stroke, coronary heart disease, kidney failure, cataracts, glaucoma, damage to the retina of the eye that can make it very small, impotence, liver tissue, and old wounds can be repaired, so it must be amputated as needed on feet (6).

The chronic hyperglycemic in DM contributes to various complications, in longterm damage, dysfunction and damage to various organs such as the eyes, kidneys, nerves, heart and blood vessels. Diabetics compared with diabetics have 2 times easier cerebral thrombosis, 25 times greater, 2 times coronary heart disease occurs, 17 times chronic kidney failure, and 50 times occur diabetic ulcer (7).

In the clinical definition, Diabetic Nephropathy (ND) is a complication that occurs in 40% of all DM patients and is a major cause of kidney disease in patients receiving kidney therapy characterized by microalbuminuria (30mg / day) without any dissent, coupled with expectations of pressure blood so that it decreases, finally glomerular filtration and eventually causes eventual kidney failure (8). Microvascular DM complications that cause glomerular damage cause proteins not to be excreted in the urine abnormally. The main protein that is excreted is albumin. Increased levels of protein in urine are an early sign of kidney damage due to diabetes (9).

From that problem, it is hoped that this program can question the relationship between blood glucose levels and protein in urine, to prevent or prevent diseases associated with diabetes complications in people with diabetes mellitus.

2. Research Methodology

Research methods

This research used a qualitative method research, with the type of research used is observational analytic with cross sectional design (cross section). The purpose of this study was to analyze the relationship between blood glucose levels and urine protein in patients with Diabetes Mellitus. The sample used was Diabetes Mellitus Patients with a purposive sampling method with certain criteria, patient > 40 years old, did not have previous kidney disorders, who visited the Jemursari Islamic Hospital during the study period. The amount of samples in this study was 25 samples which were calculated using the Slovin formula.

Time and Place

The location of the study was carried out at the Urinalysis Laboratory of Jemursari Islamic Hospital, Jl. Raya Jemursari No. 51-57. Jemur Wonosari Wonocolo, Surabaya.

Tools and Materials

The instruments and research tools needed in this study are: serological tubes, centrifugation, micropipette, syringe, alcohol swabs, tissue, tourniquet, urine pot, clinical chemistry analyzer, and urinalysis reader.

Procedure

The following procedure works: First, sample preparation is done by screening samples from a number of known populations. Secondly taking 3 cc venous blood samples then put them into activator gel tubes and shake to form number 8, then the urine samples are collected in urine pots and labeled as patient identities including name and sex in the laboratory of Jemursari Hospital, Surabaya, comparing positive urine protein levels with group of blood glucose levels.

3. Result and Discussion

From the research that has been conducted on 25 respondents of Diabetes Mellitus patients who did the examination at Jemursari Islamic Hospital, and screening was carried out according to the specified criteria, the following results were obtained, 18 respondents (72%) positively contained urine protein with a minimum protein content of 25 and a maximum of 500, while 7 respondents (28%) did not find protein in urine. Furthermore, to find out the exact hypothesis, data analysis was performed using SPSS 23.0. First of all, it is necessary to do a normality test first to find out the data distribution, then do the correlation test in accordance with the data, if the data is normally distributed the correlation test is performed using parametric correlation test, whereas if the data is not normally distributed the test uses non parametric.

Table 1. Normality Test

Variabel	Kolmogorov - Smirnov	Shapiro - Wilk
Blood Glucose		
Statistic	0,304	0,702
df	25	25
Sig	0,000	0,000
Protein Urine		
Statistic	0,275	0,662
df	25	25
Sig	0,000	0,000

From the results of the normality test shows a significance value of 0,000 which shows a number smaller than the value of α (<0.05), so that the data can be declared not normally distributed, for that then the data must be analyzed using a non-parametric correlation test.

Table 1: Correlations Test

Variabel	Value (ρ)	Keterangan
Relationship Blood glucose to Protein urine	0,418	ρ value > alfa (α)

After it was found that the data obtained were not normally distributed, a correlation test was conducted to determine whether or not there was a relationship between blood glucose levels and urine protein levels in people with diabetes mellitus. This test uses the spearman rho correlation test for the non parametric correlation test. Determination of results is determined by a significance value (ρ) with an alpha value (ρ) = 0.05. the significance value obtained is 0.418. Significance value obtained > α then shows there is no relationship between the variables tested.

The results of this study are not in line with the research Suresh et al (10) which found that there was a relationship between albuminuria and poor glucose control, as well as research from Sari and hisyam (7) showed a significant relationship between type II diabetes mellitus and chronic renal failure. The difference in the results of the analysis in this study is influenced by several factors that influence urine protein, namely food consumed before, blood pressure, race, duration of diabetes, family history of diabetes mellitus, complications suffered by patients such as heart disease or kidney disorders.

The results of different analyzes were also caused by characteristics, and the number of samples studied was different. It also requires a larger and varied number of samples from the sample so that it is more representative of the population. Based on the examination of fasting blood sugar, as many as 25 respondents (100%) had blood glucose levels that fall into the category of hyperglycemia, these respondents were patients with controlled blood glucose levels, some used insulin injections with insulin units that differed according to the prescription from doctors, some also use oral drugs to control their blood glucose levels.

After examining the urine protein as many as 7 respondents (28%) had normal urine protein values, meaning that no protein in the patient's urine was found, and 18 respondents (72%) entered the proteinuria category with varying protein levels. After the data was obtained the research process was continued with data analysis using statistical tests. The normality test is done first, the normality test on this statistic is used to find out whether the sample used has represented the distribution or not. This test uses the Kolmogorov Smirnov test due to the number of samples > 15 using the SPSS 23.0 application, then the correlation test is carried out. After it is known that the data obtained is not normally distributed, the test used the non-parametric correlation test spearman's rho test.

Significant value in this study shows a value is bigger than alpha, this indicates that there is no significant result between blood glucose levels to the appearance of protein in urine. From the research data, it was obtained from all 12 respondents (48%) of whom were male, and 13 respondents (52%) were female. This is in line with regional health research data (11) which states that diabetes mellitus is more prevalent among women than men, as well as in his research Amira (12) which states that the high incidence of diabetes in women is caused by several risk factors such as obesity, lack of physical activity, history of gestational diabetes, and polycystic ovary syndrome.

This study used respondents over the age of 40 because it was suspected that patients had experienced diabetes for years, after being seen from medical record data, on average patients had experienced conditions of hyperglycemia for many years. after being seen from medical record data, on average patients have experienced conditions of hyperglycemia for years. The discovery of

4. Conclusion

Based on the results of the study, the relationship of blood glucose levels to urine protein in patients with diabetes mellitus in Jemursari Islamic Hospital can be concluded that there is no significant relationship between blood glucose levels to urine protein in patients with diabetes mellitus with a value (ρ) > value (α) = 0.05) that is equal to 0.418.

5. Thank You Note

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