

Differences in Results of Examination of Urine Protein Levels Dipstik Method with 6% Acetic Acid Method in Patients with Diabetes Mellitus in Area Puskesmas Baturraden II

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ABSTRACT

Diabetes Mellitus (DM) is a non-communicable disease and a major public health issue in Indonesia and around the world. Proteinuria caused by diabetes in the blood vessels can cause kidney damage. Diabetes can also cause nerve damage in the body. This can make urinating difficult. The pressure caused by a full bladder can harm the kidneys. If urine remains in the bladder for a longer duration, it can cause an infection due to the rapid growth of bacteria in urine with a high sugar level, even if the presence of protein in the urine has been tested in a laboratory. Objective: The study aims to determine the difference in the results of urine protein examination with the dipstick method with the 6% acetic acid method in DM patients in the working area of the Baturraden II Puskesmas (Public Health Center). Methods: The research design used was analytic observational with a cross-sectional study. Thirty urine samples were used with purposive sampling as the sampling technique. Chi-Square Test was employed for Statistical Analysis. The results of the tests produced a significant value of 0.000 (P 0.05), indicating that the p-value was lower in relation to the degree of error. It could be concluded that the results of urine protein examination using the dipstick method and the 6% acetic acid method differed in DM patients.

INTRODUCTION

Diabetes Mellitus (DM) is a non-communicable disease which is a serious health problem for the people of Indonesia and the world. DM is characterized by blood sugar levels when more than 200 mg/dl, and fasting blood sugar levels more than 126 mg/dl (Hestiana, 2017). Conditions that continue to increase glucose so that the metabolism in the body is not balanced. This can cause serious long-term complications including causing kidney damage which results in the presence of protein in the urine (Putri, 2015).

Urine protein is a condition when the urine protein level is above normal due to kidney damage. Normal urinary protein excretion is 150 mg/day. In general, there are two methods for examining urine protein. The first method is the heating method using 6% acetic acid, the second method is the test strip or dipstick. Both of these methods can be used to determine the level of sensitivity (Triyadi, et al., 2017)

The presence of proteinuria associated with diabetes in blood vessels can result in kidney injury. Diabetes can cause nerve damage in the body. This can cause difficulty

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emptying the bladder. The pressure that results from a full bladder can injure the kidneys. If urine remains in the bladder for a long time, an infection can develop from the rapid growth of bacteria in the urine which has a high sugar level even if the laboratory tests have protein in the urine (Siregar, 2019).

METHODS

Type and Research Design This study used an analytic observational cross-sectional study. Observations were made regarding differences in the results of examining urine protein levels using the dipstick method and the 6% acetic acid method. The research was conducted in November 2021-July 2022. Examination of urine protein levels using the dipstick method using the 6% acetic acid method was carried out on May 15 2022 at the Baturraden II Health Center. The sample used was a urine sample when a DM patient had done a fasting blood test at the Baturraden II Health Center. The sampling technique was purposive sampling. The tools used are solution bottles, pipettes (pyrex), urine pots (GP). The materials used in this study were aquadest, 25% vinegar, tissue, methylated spirits, labels. Analysis of the data used in this study. Urine protein content using dipstick method was analyzed by univariate test. Urine protein content 6% acetic acid method was analyzed by univariate test. Urine protein content dipstick method and 6% acetic acid method were analyzed using the Chi Square test. This research was carried out after obtaining Ethical Clearance approval from the Health Research Ethics Commission at Muhammadiyah University Purwokerto. Registration number: KEPK/UMP/59/IV/2022.

RESULTS AND DISCUSSION

Table 1 Results of Respondent Characteristics Data

No	Karakteristik Responden	Jumlah (n)	Persentase (%)
1.	Umur (Th)		
	< 40	0	0.0
	40-50	4	13.3
	51-60	15	50.0
	61-70	11	36.7
	< 70	0	0.0
2.	Jenis Kelamin		
	Laki-Laki	6	19.9
	Perempuan	24	80.1
2.	Merasa cepat lapar dan haus berlebihan		
	Ya	7	23.3
	Tidak	23	76.7
3.	Mengalami penurunan berat badan secara drastis		
	Ya	13	43.3
	Tidak	17	56.7
4.	Telah didiagnosis oleh dokter menderita Diabetes Melitus		
	Ya	30	100.0
	Tidak	0	0.0
5.	Memiliki penyakit lain		
	Ya	12	40.0
	Tidak	18	60.0
6.	Konsumsi obat Diabetes Melitus		
	Ya	30	100.0
	Tidak	0.0	0.0
7.	Melakukan aktivitas olah raga		
	Ya	25	83.3
	Tidak	5	16.7
8.	Mengetahui penyakit DM dapat meningkatkan kadar protein urine		
	Ya	15	50.0
	Tidak	15	50.0

Sumber: Data Primer (2022)

Based on Table 1 it is known that the majority are aged 51-60 years as many as 15 respondents (50.0%). Experiencing excessive eating patterns felt hungry and thirsty as many as 7 respondents (23.3%) who did not experience excessive eating patterns felt hungry and thirsty quickly as many as 23 (76.7%). Weight loss as many as 13 respondents (43.3%). No weight loss body (56.7%). Diagnosed by doctors as having diabetes mellitus with a total of 30 respondents (1000%). 12 respondents (40.0%) had other diseases such as hypertension, asthma, stomach acid, and 18 respondents (60.0%) did not have a history of other diseases. Doing sports activities as many as 25 respondents (83.3%) who do not do sports activities as many as 5 respondents (16.7%). Knowing diabetes mellitus can increase urine protein levels by 15 respondents (50.0%) who do not know diabetes mellitus can increase urine protein levels by 15 respondents (50.0%).

Table 2. Dipstick method urine protein results

Hasil Dipstik	Jumlah (n)	Persentase (%)
Negatif	22	73.3
Positif 1	4	13.3
Positif 2	4	13.3

Sumber: Data Primer 2022

The number of research respondents was 30 samples, urine protein examination was carried out using the dipstick method, 22 respondents (73.3%) had negative (-) results. Positive results 1 (+1) as many as 4 respondents (13.3%). Positive results 2 (+2) as many as 4 respondents (13.3%).

Table 3. Urine protein results Acetic Acid Method 6%

Hasil Asam Asetat 6%	Jumlah (n)	Persentase (%)
Negatif	25	83.3
Positif 1	2	6.7
Positif 2	3	10.0

Sumber: Data Primer 2022

Based on Table 3. It is known that the number of research respondents was 30 samples, urine protein examination was carried out using the 6% acetic acid method, negative results were obtained by 25 respondents (83.3%). Positive results 1 (+1) as many as 2 respondents (6.7%). Positive results 2 (+3) as many as 3 respondents (10.0%).

Table 4 Results of Urine Protein with Dipstick and Acetic Acid Method 6%

Variabel	n	Median (minimum-maksimum)	Mean \pm SD	P Value
Metode Dipstik	30	1.00 (1-2)	0,79 \pm 0,430	0.000
Metode Asam Asetat 6%	30	1.00 (1-2)	0,69 \pm 0,379	

Source: Primary Data 2022

Based on Table 4, this study was conducted using statistical tests to find out differences in the results of urine protein examination using the dipstick method with the

6% acetic acid method using the chie square test. small according to the degree of error that has been set. So it can be said that there are differences in the results of the urine protein examination using the Dipati method with the 6% acetic acid method in patients with diabetes mellitus in the working area of the Baturraden II Public Health Center, so that it is in accordance with the written hypothesis that H0 is rejected and H1 is accepted.

Based on research that has been carried out from the differences in the results of urine protein examination using the dipstick method with the 6% acetic acid method in DM sufferers as many as 30 respondents. Examination of the dipstick method yielded negative (-) results for 22 respondents (73.3%). Positive results 1 (+1) as many as 4 respondents (13.3%). Positive results 2 (+2) as many as 4 respondents (13.3%). Examination for the 6% acetic acid method obtained negative results as many as 25 respondents (83.3%). Positive results 1 (+1) as many as 2 respondents (6.7%). Positive results 2 (+3) as many as 3 respondents (10.0%). These results are different from the two methods caused by several factors, namely the visual reading of the results is not confirmed by an automatic tool, the use of strips that have been exposed to oxidation for too long so that the results are not as they should be.

Based on the comparison results from references, it was obtained data on the degree of proteinuria in the sample of DM patients, namely 2 respondents (4.2%) had negative degree of proteinuria, 10 respondents (20.8%) sampled degree of proteinuria +1, 12 respondents (25.0%) proteinuria +2, 13 respondents (27.1%) degree proteinuria +3, and samples with +4 degree proteinuria were 11 respondents (2.9%). The development of diabetes and its complications are strongly influenced by metabolism (Mardewi, 2016).

CONCLUSION

Characteristics of research subjects at the Baturraden II Health Center included age, sex, diet, weight loss, diagnosis of diabetes mellitus, medical history, consumption of diabetes mellitus drugs, sports activities, increased levels of urine protein. Examination of urine protein using the dipstick method from a total of 30 samples obtained negative results (-) as many as 22 respondents (73.3%), positive 1 (+1) as many as 4 respondents (13.3%) and positive 2 (+2) as many as 4 respondents (13.3%).

The results of urine protein examination using the Acetic Acid method 6% of the total there were 30 samples obtained negative results as many as 25 respondents (83.3%). Positive results 1 (+1) as many as 2 respondents (6.7%). Positive results 2 (+3) as many as 3 respondents (10.0%).

The results of urine protein examination using the dipstick method using the 6% acetic acid method using the Chie Square test. The results of the tests that have been carried out obtained a significant value of 0.000 ($P < 0.05$), which means that the p value is smaller according to the degree of error that has been determined. So it can be said that there are differences in the results of the examination.

REFERENCE

Abdulqawi Ali, A.-S., Abdullatif Daiffallah, A. And Hussein Al, J. (2019) 'Prevalence Of Proteinuria Among Type 2 Diabetic Patients In Dhamar Governorate, Yemen', *International Journal Of Diabetes And Clinical Research*, 6(2).

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- Afdal, A. And Rini, E. A. (2012) 'Neglected-Noncompliant Type 1 Diabetes Mellitus With Complications', *Jurnal Kesehatan Andalas*, 1(2).
- Astuti, D. S. (2017) 'Kadar Protein Urine Menggunakan Uji Asam Asetat pada Mahasiswa Pendidikan Biologi Semester VI FKIP UMS 2017 Urinary Protein Content Using Asetic Acid In Biology Student Semester VI of Teaching and Learning Education Faculty , Muhammadiyah University of Sur', *Proceeding Biology Education Conference*, 14(1).
- Budiman, J. Y. And Muninggar, J. (2020) 'Investigasi Difusi pada Sistem Urinari untuk Gangguan Fungsi Ginjal Model Empat Kompartemen Menggunakan Metode Monte Carlo', *Wal'afiat Hospital Journal*. Pp. 3–7.
- Djamaluddin, N. And Mursalin, V. M. O. (2020) 'Gambaran Diabetes Melitus Gestasional Pada Ibu Hamil Di RSUD Prof. Dr. H. Aloe Saboe Kota Gorontalo', *Jambura Nursing Journal*, 2(1).
- Fanani, A. (2020) 'Hubungan Faktor Risiko Dengan Kejadian Diabetes Mellitus', *Jurnal Keperawatan*, 12(3).
- Hanifah, A. (2012) 'Pengaruh Penundaan Waktu Terhadap Hasil Urinalisis', Pp. 1–58.
- Hardianto, D. (2021) 'Telaah Komprehensif Diabetes Melitus: Klasifikasi, Gejala, Diagnosis, Pencegahan, dan Pengobatan', *Jurnal Bioteknologi & Biosains Indonesia (JBBI)*, 7(2).
- Harmawati And Etriyanti (2019) 'Upaya Pencegahan Dini Terhadap Diabetes Melitus Tipe 2', *Jurnal Abdimas Sainika*, 2(2).
- Hestiana (2017) 'Faktor-Faktor Yang Berhubungan Dengan Kepatuhan Dalam Pengelolaan Diet Pada Pasien Rawat Jalan Diabetes Mellitus Tipe 2 Di Kota Semarang' *Jurnal Of Health Education*, 2(2).
- Jeon, J. And Kim, J. (2021) 'Dipstick Proteinuria And Risk Of Type 2 Diabetes Mellitus: A Nationwide Population-Based Cohort Study', *Journal of Translational Medicine*, 19(1).
- Kemkes RI. (2018). *Profil Kesehatan Indonesia 2018*. In *Science As Culture* (Vol. 1, Issue 4).
- Mardiana, T., Ditama, E. M. And Tuslaela, T. (2020) 'Mendiagnosis Penyakit Diabetes Melitus Dengan Menggunakan Metode Extreme Learning Machine' *Jurnal Riset Informatika*. (Vol. 2, Issue 2).