Assessments of Urine Parameters in Diabetes Mellitus Patients in Jimma University Specialized Hospital, South West, Ethiopia, 2018

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Introduction

Diabetes mellitus is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. e chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of di erent organs, especially the eyes, kidneys, nerves, heart, and blood vessels [1].

e type of diabetes is based on the presumed etiology. ere are two most common types of diabetes: type 1 and type 2 diabetes. In type 1 diabetes, the body does not produce insulin, and daily insulin injections are required. Type 2 diabetes is the result of failure to produce su cient insulin and insulin resistance [2].

Several pathogenic processes are involved in the development of diabetes. ese range from autoimmune destruction of the -cells of the pancreas with consequent insulin de ciency to abnormalities that result in resistance to insulin action. e basis of the abnormalities in carbohydrate, fat, and protein metabolism in diabetes is de cient action of insulin on target tissues.

De cient insulin action results from inadequate insulin secretion and/or diminished tissue responses to insulin at one or more points in the complex pathways of hormone action. Impairment of insulin secretion and defects in insulin action frequently coexist in the same patient, and it is o en unclear which abnormality, if either alone, is the primary cause of the hyperglycemia [1]. *Corresponding author: Aklilu Getachew, Department of Clinical Chemistry, School of Medical Laboratory Science, Faculty of Health Sciences, Institute of Health, Jimma University, Jimma, P.O.Box -378, Ethiopia, Tel: +251911743331; E-mail: akeachew.2@gmail.com

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diabetes have an increased incidence of atherosclerotic cardiovascular, peripheral arterial and cerebrovascular disease. Hypertension and

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the color chart on the reagent strip container. e instructions that came with the strips indicating how to wait to correctly for the color change was diagnostic, and was strictly followed. For the microscopic examination we rst open the urine cap and well-mixed the sample of urine (12ml) in test tube was centrifuged at 1000 rpm for 3minutes and the supernatant was poured o then a well A well-mixed sediment of urine was used for microscopic examination under High and low power eld.

Data analysis

Data was cleaned, edited, checked for completeness and entered to EPI info version 3.5.3 and then transferred to SPSS version 20 statistical package for analysis. Bivariate and multivariate logistic regression was used to see the association between dependent variables and independent variables. A p-value< 0.05 was considered as statistically signi cant.

Data quality management

To ensure the reliability and validity of the study, the following activity was done just before and during performing the procedures.

For the interview we translated the questionnaire the local language and we also used data collectors who are able to speak the local language.

Prior to the use of the questionnaire, it was checked for its completeness and we also under take for checking the completeness and consistency.

We also gave two days training for data collectors on how to collect using both the questionnaire and checklist.

To assure the quality of the data from laboratory analysis standard operating procedures (SOPs) was strictly followed during specimen collection and other laboratory procedures.

All reagents strip kits was checked for their expiry date and used according to the manufacturer's instructions.

Training/orientation was given for specimen collector to apply standard operational diagnostic procedures to ensure the quality of each test.

e data collection, application of standard procedure, accuracy of test results was supervised by principal investigator.

Result

Socio-demographic characteristics of the study participants

From the total of 275 DM patients who attend JUS Hospital during

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for epithelial cells/ LPF followed by116 (42.2%) WBC/HPF, 98(35.7%) few RBC/HPF (Table 4).

Association of Urine parameters with factors

It was found that DBP and SBP were signi cantly associated with a positive urine protein. Moreover, sex, HT and type of DM were found to be statistically with high signi cance association with a positive urine

DM. Management of DM is dynamic. With better understanding of the pathogenesis of DM, there have been many changes in the treatment of the disease.

e expanding eld of inquiry into DM is likely to be the source of future break-through in treatment. Urine physical and chemical parameter will also play an enormous part in this regard. In this study alteration of urine parameters in DM patients have been evaluated. In this study, 40(14.54%) participants had urine proteinuria which was somehow consistent with a study conducted in India (9.4%), (25) Denmark (13.8%)(23).

On the other hand, the current study was much lower than a study conducted in Bahrain, UAE, and Oman (42.5%, 34.5%, and 29%), respectively(22) and in Shakiso, Ethiopia (30.8%)(27) among type 2 DM patients. e di erence might be the di erence in study design, lifestyle, socioeconomic status or environmental/genetic factors.

e prevalence of proteinuria was higher in type 2 DM 30 (10.9%) than in type1 DM 10(3.6%) patients in the current study. is might be due to type 2 DM patients are more likely do have hypertensive, obesity, and advanced age which commonly associated with proteinuria.

Moreover, our result demonstrated proteinuria has a signi cant association with hypertensive DBP (12%) (P-value=0.002). e presence of proteinuria suggests kidney disease which is a common complication of DM and requires further evaluation.

Another nding of the current study showed, 188(68.3%) had urine positive for glucose among the participants. the current study was higher than a study conducted in Japan for Urine Glucose Screening Program at Schools in Japan to detect Children with Diabetes and Its Outcome-Incidence and Clinical Characteristics of Childhood Type 2 Diabetes was Approximately 30– 60% of children who show positive test for urine glucose.

e result demonstrated that urine glucose was signi cantly associated with hypertension, alcoholic consumption, age and sex .for further cooperation I can't get research done to compare with prevalence of glycosuria.

And also Another nding of the current study showed, 100(36.35%) had urine positive for ketone among the participants which was somehow consistent with a study conducted in selected hospitals in Addis Ababa for Clinical Characteristics of Diabetic Ketoacidosis in Children with Newly Diagnosed Type 1 Diabetes was (35.8%) presented with DKA at rst diagnosis of diabetes.

e prevalence of ketone was higher in type 1 DM 69(25.1%) than in type2 DM 18(6.54%) patients in the current study. this is due to type 1 diabetes have lost the ability to produce any insulin, so ketone can occur when insulin doses are missed, or when the body's insulin requirements rise due to stress or illness, Moreover, sex, HT and type of DM were signi cantly associated with a positive urine ketone. Another point in this study was that when I compare the urine physical parameter with the chemical parameters of DM patients, Turbidity or cloudiness of DM patient's urine be caused by excessive cellular material or protein in the urine of DM Patients. the presence of bacteria, red or white blood cells in DM patients urine is caused by Cloudy urine of the DM patients.

Conclusion and Recommendation

In this study, a higher proportion of DM subjects had altered urine parameters those Altered urine chemical test among the participant was protein 14(14.54%), ketone 100 (36.35%), leukocyte esterase 155(56.36%), and glucose 188(68.4%). It was found that DBP and SBP were signi cantly associated with a positive urine protein. Sex, HT and type of DM were signi cantly associated with a positive urine ketone. Moreover; age, hypertensive and blood glucose were signi cantly associated with urine glucose. WBC, epithelial cell, casts, and crystals were major microscopic ndings. By recognizing the above the following recommendation was given:-

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ere should be periodic assessment of urine parameters in the routine follow-up of DM patients

Kidney function tests should be performed to assess DM related complication

Further longitudinal studies should be done to identify determinant factors

Early diagnosis, the improvement of care and constant monitoring of patients should be the focus of primary prevention.

Availability of Data and Materials

All the data and the materials we used in this research will be available up on request any legal concerned body at any time.

Declaration

Ethical consideration

as nal approval of the version to be published.

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