Rachel Yusuf

Bio 2312-D057

Wednesdays 2:30 PM-5:00 PM

Urinalysis Lab Report

Introduction

As every system in the body, the urinary system is just as important. The urinary system has different functions involving excretion which is the removal of waste products from fluids within the body. It also involves elimination which is when waste products are being discharged and maintains the blood pH while regulating blood pressure and volume.

The urinary system involves the kidneys which produces urine. The ureters transports urine towards the urinary bladder. The urinary bladder stores the urine before being eliminated. Lastly, the urethra leads the urine to exterior. According to www.hopkinsmedicine.org, the body gets nutrients from the foods that are being eaten and once it grabs whatever it needs, waste products are left into the blood and bowel (Anatomy of the Urinary System). The kidneys and the urinary system helps the body get rid of waste called urea and keep potassium, sodium and water well balanced.

The kidneys are very important to the urinary system. The kidneys are made up of filtering units called nephrons. Each nephron has small blood vessels called a glomerulus that is attached to a tubule. After the blood enters the glomerulus, it's filtered and the rest of the fluid goes through the tubule. In the tubule, chemicals and water can be removed or added depending on the what the body needs and what is left is the urine that ends up being secreted. The kidneys filter around 200 liters of blood a day and produces 1-2 liters of urine. The kidneys even produce hormones called renin, erythropoietin and vitamin D (Healthwise Staff, 2018). Renin helps regulate blood pressure so if one's blood pressure drops too low, renin will be sent the blood

stream. Erythropoietin stimulates the red blood cell production which will carry oxygen from lungs throughout the entire body while vitamin D helps maintain strong bones.

Nowadays, people take a urinalysis at their local doctors or clinics. A urinalysis is a test that looks at a sample of one's urine. A urinalysis is used to see if one has urinary tract infections, diseases like diabetes, kidney disease, and even pregnancy abnormalities (Whitlock, Jennifer 2020). Most often, people pee in a cup at the doctor's office however, that isn't the only type of urinalysis. A complete urinalysis is performed in the lab to assess chemical and physical characteristics of your urine. There is a rapid urinalysis which is the most common in the doctor's office and involves the use of test strips to see if there are any complications. There is also a 24-hour urine collection which is when the urine is observed for over 24 hours so that the doctor can have a better understanding of your urine and renal function.

During a urinalysis, urine sample is evaluated by the visual exam, dipstick test and the microscopic exam. In the visual exam, the urine is being physically visualized. Since urine is usually clear, if there is a bit of cloudiness or smells odd, this can be sign of infection. Next is the dipstick test which is a small plastic stick than has squares of chemicals on it in order to see if there are any abnormalities or complications in the urine. The chemical strip changes if there are chemicals present and they are compared to the color chart. The dipstick test checks for acidity which shows the pH level in the urine, specific gravity which show the concentrated particles in the urine, protein, sugar, ketones which can show a sign of diabetes, bilirubin which is the result of the breakdown in red blood cells, infections such as UTIs and blood which can show a sign of any kidney infections, damage or abnormalities (Mayo Clinic Staff, 2019). The microscopic

exam involves the use of a microscope to view several drops of the urine. In the lab, they will see if leukocytes, red blood cells, bacteria, casts and crystals are above normal ranges and if so, they will have to do further testing to see what is going on inside of the body.

The purpose of this lab activity was to compare the three urine samples through urinalysis by using a dipstick.

Materials and Methods

In order complete this urinalysis there were certain materials that were needed. The materials were, disposable gloves, the three urine samples given (1 normal urine and 2 abnormal urines samples), wide ranged pH paper, the three Multistix (dipstick) that were used for each sample, urinometer, test tube, test rack, test tube holders and 10-cc graduated cylinders. Each of the Multistix contained 10 chemical strips. The first sample contained normal urine and the other two were abnormal. First one must wash their hands and put on their gloves. The Multistix was then dipped into each of the urine samples and once taken out each test had to be appropriate to the time interval given on the dipstick analysis chart. Glucose and bilirubin was 30 seconds, ketone and specific gravity was 40 and 45 seconds. Blood, pH, protein, urobilinogen and nitrite were 60 seconds and leukocytes were 2 minutes.

Results

Urinalysis Results from Multistix

	Normal Urine (Artificial)	Abnormal Urine 1 (Artificial)	Abnormal Urine 2 (Artificial)
Leukocytes	Negative	Negative	Negative
Nitrate	Negative	Negative	Negative
Urobilinogen	0.2 mg/dL (normal)	0.2 mg/dL (normal)	0.2 mg/dL (normal)
Protein	Negative	2000 mg/dL or more (++++)	2000 mg/dL or more (++++)
pH	6.5	6.0	8.0
Blood	Negative	Hemolyzed trace	Large (+++)
Specific Gravity	1.030	1.030	1.005
Ketone	Negative	Negative	Trace 5 mg/dL
Bilirubin	Negative	Negative	Negative
Glucose	Negative	2000 mg/dL or more	1000 mg/dL

Discussion and Conclusion

The urine analysis of the first sample came back as normal. In the test, there was negative in glucose which shows that there was sign of diabetes. Bilirubin also came out negative which means that there was no sign of any liver damage. Ketone also came out negative which is good

because they are produced when glucose is not available such as a person with diabetes. Specific gravity was normal as well although it could be better however a score of 1.000 isn't possible because there are substances in urine. There was no blood found in the sample which is normal. There was also a negative in protein which indicates there is no sign of any kidney disease. Nitrate also came out as negative which showed that there weren't any UTIs found. Lastly, there was a negative for leukocytes which can be a sign of inflammation or infection in the kidneys or urinary tract. In the other two abnormal urine samples, there were high levels of glucose which showed that there is high blood sugar. There were also higher than average blood levels which can show that there could be possible infection or kidney abnormalities/failures.

In order to improve the lab activity one should take more samples from the participants as time progresses. Since there was a big difference between the normal urine sample compared to the abnormal samples, one should encourage the abnormal participants to eat a healthier diet and drink more water in order to see a difference in urine sample. The participants should be educated on what they can do to live a healthier life and make sure that if there are no changes, to see a specialist for further information.

Work Cited

"How the Kidneys Work." *HealthLink* BC, 2018, www.healthlinkbc.ca/health-topics/tp13026.

Whitlock, Jennifer, and Msn. "What Do My Urinalysis Results Mean?" *Verywell Health*, 24 Feb. 2020, www.verywellhealth.com/what-do-your-urinalysis-results-mean-3156950.

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"Urinalysis." *Mayo Clinic,* Mayo Foundation for Medical Education and Research, 23 Oct. 2019, www.mayoclinic.org/tests-procedures/urinalysis/about/pac-20384907.