Urinalysis Lab Report

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Human Anatomy and Physiology II

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Tuesdays-Thursdays 2:30PM-5:00PM

Introduction:

The urinary system is crucial in getting rid of the "metabolic waste produced by the body's cells" (Martini et al., 977). This metabolic waste is expelled in the form of urine by the kidneys. However, the urinary system is not this simple and is actually quite complex.

The urinary system consists of two bean shaped structures called the kidneys, the ureters, urinary bladder, and urethra. This organs all occur the same way in both makes and females. These organs all come together to create the urine that is expelled from the body. Urine leaves from the kidneys and travels down a pair of tubes which are the ureters. The urine then enters the urinary bladder where it is stored until it is ready to exit the body through the urethra through the process of urination. Urine itself is composed of mainly water but is also composed of ions, and small soluble compounds, this includes nitrogenous bases and creatine. The composition of urine can also vary due to injuries or infections. While the urinary system works hard to excrete waste products from the body, it also has many other functions.

The functions of the urinary system include the regulation of blood volume, blood pressure, and plasma concentrations of sodium, potassium chloride, and other ions. This regulation is crucial to the homeostasis of the body. This is done by controlling the quantity of certain substances present in the urine. The urinary system also functions to stabilize the pH of the blood, conserve valuable nutrients, and assist the liver. Regulation in the urine is mainly regulating what ends up in the urine whether it be expelling toxins and unneeded waste or retaining important substances that we do not want to leave the body.

In this lab experiment we will be conducting a urine analysis. A urine analysis is very important it can reflect the chemical components found in the blood. We can learn a lot about what is happening to the body through the content and appearance of our urine. With a urinalysis

we can test for fluctuations in the contents in our urine. We can make sure what belongs in our urine belongs there and what doesn't, is thoroughly analyzed. Several infections and diseases can be detected using urine, whether it be glucose present meaning diabetes, or a cloudy appearance signifying a urinary tract infection. A urinalysis can tell us a lot about our bodies.

Objective:

The purpose of this lab activity was to analyze and compare three urine samples and determine what the abnormalities in them signify.

Materials & Methods:

Three different urine samples were compared and analyzed in this experiment. All samples were handled with disposable gloves being worn. Three multistix strips were used. One multistix was dipped into the normal urine artificial sample. The multistix was then set down develop in front of the sample bottle. The second multistix was dipped into the abnormal urine-1 artificial sample and then set down to develop in front of the sample bottle. The third multistix was dipped into the abnormal urine-2 artificial sample and then set down to develop in front of the sample bottle. Once all 3 mutltistix strips developed observations of the color on the strips were interpreted with the use of a chart describing what each color meant. All results and observations were then recorded.

Results/Data:

	Analysis									
Sample Type	Leukocytes	Nitrite	Urobilinogen	Protein	pH	Blood	Specific Gravity	Ketone	Bilirubin	Glucose
Normal Urine Artificial	Negative	Negative	0.2 mg/dL	Negative	6.5	Negative	1.025	Trace 5 mg/dL	Negative	Negative
Abnormal Urine-1 Artificial	Negative	Negative	0.2 mg/dL	100 mg/dL ++	6.0	Negative	1.030	Negative	Negative	2,000 mg/dL or more
Abnormal Urine-2 Artificial	Negative	Negative	0.2 mg/dL	300 mg/dL +++	8.0	Large +++	1.005	Trace 5 mg/dL	Negative	1,000 mg/dL

Discussion/Conclusion:

All three urine samples tested yielded different results. These results will indicate the condition of the person it came from, if the samples had come from an actual person rather than being made artificially. The first thing the samples were tested for was leukocytes. All 3 samples were negative for leukocytes. All 3 also were negative for the presence of nitrites. This is a normal indication. If leukocytes and nitrites had been present it would have meant that the body is battling an infection in the urinary tract. Next the samples were tested for urobilinogen. It is normal for urobilinogen to be found in urine and all 3 samples had a normal amount of it. According to MedlinePlus, high amounts of urobilinogen in urine could indicate a problem with liver function, diseases such as hepatitis and cirrhosis. When the samples were tested for protein the normal urine sample came up negative, which is normal for a healthy person. Abnormal Urine-1 had a presence of 100 mg/dL of protein in it while Abnormal Urine-2 had 300 mg/dL present, even worse. Protein should never be found in urine as protein molecules are too large to

“pass through the glomerular filtration barrier” (Nursing Times). The protein present in these 2 samples can indicate many things, whether it be hypertension, kidney damage, or diabetes. The pH of the samples was tested next. The normal pH range for urine is 4.5-8 and all 3 samples fell into the range, although Abnormal Urine-2 was on the high-side of the sample. If the urine were anymore acidic or basic it could indicate urinary stones or a bacterial infection. When urine is tested for blood, it should always come up negative. The presence of blood in urine is known as haematuria. While the Normal Urine and Abnormal Urine-1 samples came up negative for blood, Abnormal Urine-2 tested positive for large amounts of blood. This could indicate several things such as “trauma, smoking, infection” (pdf) and so much more. Urine usually ranges from being diluted to concentrated and this shows the hydration of the person the sample was taken from. The normal range for specific gravity is 1.001-1.035. The specific gravity of 3 samples fell right into the normal range. Ketones are not usually found in urine. Their presence indicates things such as diabetes, starvation, and even pregnancy. Abnormal Urine-1 came up negative while the Normal Urine and Abnormal Urine-2 samples showed a trace amount. This trace amount should be analyzed further but does not indicate anything serious as of yet. Test for bilirubin came up negative for all 3 samples which is good. If bilirubin was present in the urine it could indicate liver disease, biliary tract infection or obstructive jaundice, according to Aci Health. Glucose was the last thing that was tested. While the Normal Urine sample came up negative for glucose, Abnormal Urine-1 sample had 2,000 mg/dL and Abnormal Urine-2 sample had 1,000 mg/dL. Glucose does not occur naturally in urine. Its presence means the kidneys reached their renal threshold of glucose and must now excrete it through urine to decrease blood concentration. This is indicative of several conditions including diabetes, pregnancy, and the presence of certain medications.

With the use of a dipstick we are able to perform a urinalysis that can tell us a lot about an individual just by using a few milliliters of urine. While these dipstick tests might not be accurate all the time, they are very helpful for shedding light on conditions with minimal testing to start out with. They are easy to administer at home and help many people before even making the trip to see a doctor. They are also very efficient for testing for multiple things at once, which is very helpful when some results are needed as quick as possible.

Works Cited

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