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Urinalysis Lab

Introduction:

The urinary system, also called the renal system, consists of the kidney, bladder, ureters, and the urethra. The urinary system is responsible for eliminating waste and toxins from the body, regulating blood and pH, controlling electrolytes and metabolites, and maintaining an acid/base balance. The fluid that's accountable for the release of the waste in the body is urine. Urine is the by-product of metabolism produced by the kidneys. Urine typically consists of water, ions, nitrogenous waste, and small soluble compounds. The nephron is the structural and functional unit of the kidney that produces urine. There are over a million nephrons in each kidney, and each nephron works together to remove, exchange, and regulate blood composition. In other words, nephrons basically control what needs to be removed from the blood.

A urinalysis is a test performed on your urine. The test is often done to check for kidney problems, urinary tract infections, or diabetes. In addition, urinalysis checks for the following: change in color, unnatural appearance (Cloudy), odor, pH (acidic), abnormal substances in the urine, blood, bacteria, glucose, ketones, and bilirubin.

In this lab, we'll be comparing two patients' urinalysis tests to normal urine in an effort to detect a wide range of disorders.

Material and Methods:

There are three methods used to construct a urinalysis test, a visual exam, a microscopic exam, and the dipstick test. The visual exam is used to analyze the color and clarity of the urine. For example, if the pee is red or brown, blood has been detected, cloudy urine indicates that the person may have an infection. The microscopic exam is done to check for things that the naked eye cannot see, such as red and white blood cells, bacteria, in addition to crystals, which are clumps of minerals, a known sign of kidney stones. The last urinalysis exam is the dipstick test, which takes a thin plastic strip treated with chemicals. The strip is dipped into the urine and, assisted by chemicals, the strip reacts and changes color if the levels appear abnormal. The dipstick checks multiple things, such as **pH** (too much acid is a sign of kidney stones and a UTI), **protein** (improper function of the kidneys), **glucose** (high sugar content is an indication for diabetes), **white blood cells** (sign of infection or inflammation in the kidneys or anywhere in the urinary tract), **nitrites**(infection with certain types of bacteria), and **bilirubin**(a waste product that is typically removed by the liver).

Activity 1: Urinalysis Results

Observation or Test	**Normal Urine**	**Abnormal Urine Sample #1**	**Abnormal Urine Sample #2**
Color	Pale Yellow	Medium Yellow	Pale-Medium Yellow
Transparency	Clear	Turbid	Cloudy
Odor	Aromatic	Aromatic	Aromatic
Leukocytes	Negative	Negative	Negative
Nirite	Negative	Negative	Negative
Urobilinogen	Present	Normal	Normal
Protein	Negative	2000 or more mg/dL -	2000 or more mg/dL
pH	6.5	6	8.5
Blood	Negative	Hemolyzed Trace	Large+++
Specific Gravity	1.025	1.030	1.005
Ketone	Negative	15 (small) -	15 (small)
Bilirubin	Negative	Negative	Negative
Glucose	Negative	2000 or more mg/dL-	1000 mg/dL

Discussion / Conclusion:

As seen above, there are three samples of a urine test, one being normal urine, the other two being abnormal urine samples. There are multiple things found in the urinalysis test that bring concerns when comparing the normal urine to the two different urine samples. The transparency of the urine in both patients was not clear but instead cloudy and turbid, which draws concerns of them having an infection. Also, the exam detected a high amount of protein in both patients, meaning that their kidneys are not functioning correctly. While the pH in patient 1 is average, patient 2 has a pH of 8.5, a pH that high could mean that the patient is either suffering from kidney stones or a UTI. Even though blood was found in both patients' urine, patient 2 has a

higher amount, and blood in the urine means there is an infection in the urinary system. Also, both patients have the same amount of ketone found in their urine. Ketone is developed when your cells do not get enough glucose, and the body burns fat for energy as an alternative. The last thing that draws concern in the patient's urine is the amount of glucose found; since patient 1 has more, they're more at risk for diabetes if they don't have it already in comparison to patient 2. A urine dipstick test is a quick and inexpensive way to ensure that you're healthy. The dipstick gives patients like the ones above a chance to make a change to better their diet before it's too late by giving them a warning on odd things found in their urine that indicates their health declining.

Reference

Lecture 22-Urinary. Youtube, uploaded by Physiology for Students, 16 July 2016, https://www.youtube.com/watch?v=5VMTJCqlyLo

https://medlineplus.gov/urinalysis.html

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