Urinalysis

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Lab Report 2

Introduction

       The urinary system is a waste depleting system that consists of kidneys, ureters, urinary

bladder, and urethra. Urine is produced in the kidneys through the filtration of the blood. The

urine is formed from the filtration of urea from the blood. The urea, with the combination of

other waste products, ultimately form urine. From the kidneys, the urine travels via the ureters to

the urinary bladder. The ureters are a pair of tubelike structures. When ready for urination, the

urine travels from the urinary bladder to the urethra and exits (ROGERS et al.).

       Urine contains many substances such as water, nitrogenous bases and creatine. Different

diseases and infections can alter the chemical composition of urine. There can be multiple

underlying causes for the change in composition. To test for various key components of urine

and substances that should not be present, a multistix can be used. A multistix is dipped in the

urine sample and the labels on the multistix changes color and the results can be interpreted. The

multistix tests for leukocytes, nitrite, urobilinogen, protein, pH, blood, specific gravity, ketone,

bilirubin, and glucose (Zamanzada, 2009).

       Analyzing one's urine, also called urinalysis, helps determine certain diseases and

infections such as UTI, kidney damage, haematuria, and helps determine pH and general

hydration of the individual. Upon urinalysis, abnormal results allow for further testing and

possibly a reliable diagnosis. For example, the presence of ketones is unhealthy and can indicate

starvation and diabetes (Simerville et al.). Specific gravity indicated general hydration of an

individual and the specific gravity should lie in the range 1.001 - 1.03. (Oppliger et al.). Glucose

presence can also indicate diabetes because the body must release excess glucose through urine.

In this experiment, three artificial urines were collected and a multistix was used for analysis. Different conditions were prognosed for each abnormal result.

Methods and Materials

The materials used in this experiment were three samples of urine and a multistix. Three urine samples were collected in a clean container. All samples were handled with disposable gloves. A different multistix was dipped in the three urine samples. After each dip, each multistix was set to develop. After all dipsticks developed, the color on the dipsticks were interpreted to a chart, and an analysis was made and recorded.

Results

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

All three samples tested negative for leukocytes, nitrites, and bilirubin. All three urine samples had urobilinogen. The normal artificial urine tested negative for protein. Abnormal Urine 1 - Artificial tested for 100 mg/dL and Abnormal Urine 2 - Artificial tested for 300 mg/dL.

Normal Urine - Artificial had a pH of 6.0. Abnormal Urine-1 Artificial had a pH of 6.5. Abnormal Urine-2 Artificial had a pH of 8.0. Abnormal Urine 2 - Artificial tested positive for blood and had large amounts, while the other two tested negative. The specific gravity of Normal Urine Artificial, Abnormal Urine 1 - Artificial and Abnormal Urine 2 - Artificial was 1.025, 1.030, and 1.005, respectively. Normal urine and Abnormal Urine-2 Artificial showed a trace amount while Abnormal Urine 1 - Artificial tested negative for the presence of ketones. Normal urine tested negative for glucose while both Abnormal samples tested positive for the presence. Abnormal Urine 1 - Artificial had 2,000 mg/dL and Abnormal Urine 2 - Artificial had 1,000 mg/dL.

Discussion and Conclusion

The use of the multistix helps diagnose possible diseases and infections of the urine owner. All three samples tested negative for leukocytes, nitrites, and bilirubin. A positive test for leukocytes can indicate urinary tract infection. A negative test for nitrites is normal, however, a positive test can indicate a UTI. A positive test for bilirubin could indicate liver disease or biliary tract infection. All three urine samples had urobilinogen, which is also normal. Significantly higher amounts of urobilinogen can indicate problems with the liver. The normal artificial urine tested negative for protein. However, the abnormal urines had protein. Abnormal Urine 1 - Artificial tested for 100 mg/dL and Abnormal Urine 2 - Artificial tested for 300 mg/dL. Urine should not test positive for the presence of protein. A positive test for protein indicates possible kidney damage because the kidney does not allow the passing of proteins. The pH of the urine was also tested. The normal pH range for urine is about 4.5 to 8.0. All three samples were in this range. But, Abnormal Urine 2 - Artificial had a pH of 8.0. This is very much on the higher

side. This abnormal pH can indicate a bacterial infection or bacterial stones. A positive test for blood in the urine is haematuria. There should not be any blood in urine. Abnormal Urine 2 - Artificial tested positive for blood and had large amounts. Haematuria is indicative of possible trauma, bladder cancer and is not necessarily harmful but should be closely examined. The specific gravity of urine is indicative of the hydration of the urine owner. The normal range for healthy urine is 1.001 - 1.035 and all three samples were in the range. Ketones are not usually found in urine and a positive test for ketones is indicative of possible diabetes and starvation. Normal urine and Abnormal Urine-2 Artificial showed a trace amount while Abnormal Urine 1 - Artificial tested negative for the presence of ketones. Normal urine tested negative for glucose while both Abnormal samples tested positive for the presence. Abnormal Urine 1 - Artificial had 2,000 mg/dL and Abnormal Urine 2 - Artificial had 1,000 mg/dL. The presence of glucose is caused by the kidneys exceeding the renal threshold of glucose. Upon exceeding this threshold, the kidneys will excrete the glucose through urine. High glucose presence is indicative of diabetes. The multistix helps clarify a lot of substances in the urine simultaneously. Abnormal readings of certain substances can narrow down specific diseases and conditions and allow further analysis if necessary. To make this experiment better, the urine samples can be collected from sick patients whose conditions are already known so the efficiency of the multistix can really be observed and noted.

Works Cited

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