IDENTIFICATION OF SOME PHYSICAL, CHEMICAL, HEMATOLOGICAL, PATHOLOGICAL AND BIOCHEMICAL CONSTITUENTS OF URINE BY MACROSCOPIC ANALYSIS & MICROSCOPIC EXAMINATION

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ABSTRACT
The purpose of the present study was to define the normal hematologic values, some biochemical parameters and pathological constituents in urine of Baby boy, fasting and pregnant women to determine the effect of gender on these parameters. The hematologic parameters were determined in whole urine samples (urine protein, glucose, creatinine, urea, nitrite, Na, K, Cl, were determined in urine samples. Normal values of these parameters were determined and statistical comparisons among the samples performed. This project was carried out to evaluate and detect some parameters of Urine. In this project we determined Glucose, Urea, Albumin, pH, Chloride, Potassium, Sodium, Nitrate, and Carbonate contents in urine samples, it has been found in Urine more different elements, the result that found in this project when tested in three different sample, samples (1) baby boy and sample (2) fasting and third one pregnant, the first experiment determination of pH sample (1) 6.16, sample (2) 5.30 sample (3) 5.49. Second experiment appearance of Glucose, the Glucose only present in pregnant sample, third experiment detection of Urea and fourth experiment detection of albumin they are present in all samples, experiment five determination electric conductivity sample (1) 7.07 sample (2) 29.9 sample (3) 9.92. Experiment six determination Chloride sample (1) 1.4 g sample (2) 2.04g sample (3) 1.1. Experiment seven determination of Potassium sample (1) 19 ppm, sample (2) 44 ppm sample (3) 40 ppm, experiment eight determination of Sodium sample (1) 26ppm, sample (2) 55 ppm, sample (3) 32ppm.
Experiment nine determination of Nitrate sample (1) 0.4 ppm, sample (2) 2.5 ppm, sample (3) 0.7 ppm. The last experiment determination of appearance carbonate only present in sample (2) and (3).

**KEYWORDS:** Bio-chemical parameters, hematological parameters, urine.

**INTRODUCTION:** Is an ultra-filtrate of plasma from which glucose, amino acids, water and other substances essential to body metabolism have been reabsorbed. Urine carries waste products and excess water out of the body.

**Urine test:** A urine test checks different components of urine, a waste product made by the kidneys. A regular urine test may be done to help find the cause of symptoms. The test can give information about your health and problems you may have. The kidneys take out waste material, minerals, fluids, and other substances from the blood to be passed in the urine. Urine has hundreds of different body wastes. What you eat, drink, how much you exercise, and how well your kidneys work can affect what is in your urine.

**Urine Colour:** Shows fluid balance, diet, medicines, and diseases. Level of darkness tests amount of water the urine. Vitamin B supplements can turn urine bright yellow. Some medicines, blackberries, beets, rhubarb, or blood in the urine can turn urine red-brown.

**Urine Clarity:** Tests bacteria, blood, sperm, crystals, or mucus can make urine look cloudy.

**Urine Odour:** Diseases caused by bacteria can cause a bad odour, while diabetes can cause a sweet, fruity urine odour.
Urine Gravity or Density: Tests substances in the urine and shows how well the kidneys balance water in urine.

Urine pH: tests acidity (alkaline) of urine. Urine pH of 4 is strongly acidic, 7 is neutral, and 9 is strongly alkaline.

Urine protein: tests protein presence in urine. Protein should not be present in urine, but hard exercise, pregnancy, and some diseases, especially kidney disease, may cause presence protein in urine. Presence of specific protein called Albumin is referred to as refered to as Albuminuria.

Urine glucose: Tests glucose levels in blood. When blood sugar level is very high, it can be a sign of diabetes, or damaged kidneys.

Urine Nitrates: and Urine Nitrites - tests for urinary tract infection (UTI) to see level of enzyme that changes urinary nitrates to nitrites, which indicate UTI Leukocyte esterase (WBC esterase) - test white blood cells in the urine, indicating UTI. More about Leukocytes.

Urine Ketenes: Large amounts of ketenes in the urine may mean diabetic ketoacidosis.

Urine casts: Some urine tests show casts that form in tiny tubes in the kidneys, showing kidney disease may be present.

Other substances that may be found in a urine test

Bilirubin: A substance formed by the breakdown of red blood cells, not typically found in urine. If Bilirubin is present, it may mean liver damage or that flow of bile from the gallbladder is blocked.

Bence Jones protein: Abnormal protein found in the urine tests in about 50% of people with a rare type of cancer called multiple myeloma.[1]

Type of analysis:

Macroscopic analysis: (A) physical characteristics (B) chemical analysis.

Microscopic examination: urine sediment is examined under microscope to identify the components of the urinary sediments. Tests urine sediment for red or white blood cells (not
usually found in urine), inflammation, disease, or injury to the kidneys, ureters, bladder, or urethra.

MATERIALS AND METHODS

Organic: urea, uric acid, creatinine.

Inorganic: Cl⁻, PO₄³⁻, HBO₃⁻, NH₄, SO₄²⁻.

1. Urea: 1ml urine + 3 ml NaOCl (sodium hypochlorite) ==>Evolution of N₂ gas.
2. Uric acid UA: 1ml urine + 0.5 ml 10% NaOH +1ml Folins reagent ===> Blue color.
3. Creatinine: 1ml urine + drops Picric acid + drops NaOH ===> red color ppt. Note: if reaction is acidified with HCL, the color changes to yellow.
4. Chloride: 1ml urine + drops HNO₃ +1 ml AgNO₃==> white ppt of AgCL.
5. Phosphate: 1ml urine + 1ml conc. HNO₃ + 1ml NH₄-molybdate==>Yellow color.
7. Ammonia: Make urine alkaline with NaOH. Close the tube with a cork containing another side tube dipped in Nessler's reagent. Heat the urine and then notice the evolving of NH₃ in Nessler's reagent.
   - Detect NH₃ by its odour.
   - 1ml urine + 1ml phenol + 1ml NaBr =======> Blue color.
8. Sulphates:1ml urine + 2 drops conc. HCL + few drops BaCL₂ ===> White ppt of BaSO₄.
   SO₄ + BaCL₂ =======> BaSO₄ + 2CL-

Protein: It is normally not found in the urine. Fever, hard exercise, pregnancy, and some diseases, especially kidney disease, may cause protein to be in the urine.

Glucose: Glucose is the type of sugar found in blood. Normally there is very little or no glucose in urine. When the blood sugar level is very high, as in uncontrolled diabetes, the sugar spills over into the urine. Glucose can also be found in urine when the kidneys are damaged or diseased.

Nitrites: Bacteria that cause a urinary tract infection (UTI) make an enzyme that changes urinary nitrates to nitrites.
Leukocyte esterase (WBC esterase): Leukocyte esterase shows leukocytes (white blood cells [WBCs]) in the urine.

Ketones: When fat is broken down for energy, the body makes substances called ketones (or ketone bodies). These are passed in the urine. Large amounts of ketones in the urine may mean a very serious condition, diabetic ketoacidosis, is present. A diet low in sugars and starches (carbohydrates), starvation, or severe vomiting may also cause ketones to be in the urine.

RESULTS AND DISCUSSION

Table: 1 Physico-Chemical parameters of urine

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type of urine sample</th>
<th>Baby boy</th>
<th>Fasting</th>
<th>Pregnant</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td></td>
<td>6.16</td>
<td>5.30</td>
<td>5.49</td>
</tr>
<tr>
<td>Glucose</td>
<td></td>
<td>ND</td>
<td>ND</td>
<td>Present</td>
</tr>
<tr>
<td>Urea</td>
<td></td>
<td>present</td>
<td>present</td>
<td>Present</td>
</tr>
<tr>
<td>Albumin</td>
<td></td>
<td>NA</td>
<td>present</td>
<td>Present</td>
</tr>
<tr>
<td>EC (μs/cm)</td>
<td></td>
<td>7.07</td>
<td>29.9</td>
<td>9.92</td>
</tr>
<tr>
<td>Chloride (g)</td>
<td></td>
<td>1.4</td>
<td>2.04</td>
<td>1.1</td>
</tr>
<tr>
<td>Potassium (ppm)</td>
<td></td>
<td>19</td>
<td>44</td>
<td>40</td>
</tr>
<tr>
<td>Sodium (ppm)</td>
<td></td>
<td>26</td>
<td>55</td>
<td>32</td>
</tr>
<tr>
<td>Nitrate (ppm)</td>
<td></td>
<td>0.4</td>
<td>2.5</td>
<td>0.7</td>
</tr>
<tr>
<td>Carbonate</td>
<td></td>
<td>ND</td>
<td>present</td>
<td>Present</td>
</tr>
</tbody>
</table>

Figure: 1.Physico-Chemical parameters of urine
CONCLUSION
This project was carried out to evaluate and detect some parameters of Urine. In this project we determined Glucose, Urea, Albumin, pH, Chloride, Potassium, Sodium, Nitrate, and Carbonate contents in urine samples, it has been found in Urine more different elements, the result that found in this project when tested in three different sample, samples (1) baby boy and sample (2) fasting and third one pregnant. Analysis of urine is important conservation applications, as knowledge of reproductive parameters is essential for population liability analysis.

In the end of this project we find that, fasting has the highest pH, electrical conductivity and concentration Sodium, Potassium and nitrate. Also the dedicate appearance of albumin, carbonate and Urea is more in fasting. Baby boy has lowest pH, electrical conductivity and concentration of Sodium, Potassium and nitrate. The dedicate appearance of Glucose is more in pregnant and less in fasting.

ACKNOWLEDGEMENTS
Authors thank to Higher College of Technology, Muscat, Sultanate of Oman, for providing research facilities to the research scholar.

REFERENCES


