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METHODS
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All patients admitted in medicine wards with suspected malaria were subjected to QBC examination. Only those patients who were found to have malaria parasite positive, included in study. Those patients who were having any past history of renal, prerenal, post renal, cardiovascular, respiratory, endocrine and metabolic disease were not included.

History: Name, age, sex, family history of patients. History of fever and its duration and its relationship with oliguria and anuria were noted. History of vomiting, loose motions, headache, hemoglobinuria, proteinuria, oedema was recorded.

Physical Examination: Patients were examined for degree of dehydration, size of liver and spleen, presence of pallor, Jaundice, Hypotension, edema and any evidence of bleeding. The patients were subjected to through systemic examination and input output chart were maintained.

Collection and Storage of sample: About 10 ml of blood was collected by venepuncture from every patient after correction of hypovolemia. Two ml of blood for TLC, DLC, Hb% ESR, 2.5 ml for Q.B.C., 3.5 ml of blood for separation of serum which was preserved in a sterile vial at 20°C for 30 min for serum creatinine and serum electrolytes, 1 ml of blood in single oxlate vial for blood urea, 1 ml blood in fluoride vial for blood glucose.
**Blood Glucose Estimation Test**: By method of Asatoor and King. We take 3.8 ml isotonic solution in a centrifuge tube add 0.1 ml blood, mix and add 1 ml sodium tungstate solution, mix well by inverting tube and centrifuge after some time. Pipette 1 ml supernatant in a 15 ml tube.

**Standard** - 1 ml working glucose standard in a 5 ml tube.

**Blank** - 1 ml isotonic solution in a similar tube.

To all these test tubes add 1 ml alkaline tartrate solution, mix & plug the tubes with cotton, place them in a boiling water for 10 min. Remove the tubes cool, add 1 ml arsenomolybdate reagent to each tube, mixed by shaking till effervescence ceases. Allow the solution to stand for ten min, then add 5 ml water to each tube. Measure the absorbance after 10 min, using red filter against the reagent blank.

\[
\text{Blood glucose} \quad \left(\text{mg/100ml}\right) = \frac{T}{S} \times 100
\]

**QBC Test**: For this test 2.5 ml blood will be collected in EDTA vial. Then blood will be filled into the QBC capillary upto the red mark. The capillary will be centrifuged at the rate of 1200 RPM to 5-7 minutes. Different column of blood will be formed.

- RBC, granulocyte, lympho/Mono, plateletes.
- Immersion oil will be applied on capillary and seen under the paralens microscope.

(25.)
- P. falciparum rings are circular and smooth wall. Nucleus and cytoplasm ratio 1:1.

- Nucleus is embedded into cytoplasm (Nucleus bright green and cytoplasm pale green or pale orange).

- P. vivax rings are irregular in shape.

- Nucleus and cytoplasm ratio - 1: 5-6.

- Nucleus is outside the cytoplasm.

**Blood Urea Estimation Test**: By enzymatic method. We measure
4.5ml isotonic solution in a centrifuge tube, add 0.1ml serum & mix.

**Standard** - 4.5 ml isotonic solution in a similar tube and add 1 ml standard solution.

**Blank** - 4.6 ml isotonic solution.

Add a small pinch urease powder to each tube and mix well, plug the tube with cotton and incubate for 20 min at 37°C in a water bath, remove the tube from bath, add to each tube 2ml zinc sulphate and then 2ml sodium hydroxide mix well after each addition and centrifuge after sometime, Measure 3ml supernatant from each tube and place into another tube. Add 2ml water and 1 drop of iodine solution to

(26.)
each tube and mix. When ready to measure the absorbance, add 1ml of nessler's reagent one by one to each tube and take the reading against water blank using blue filter.

\[
\text{Blood urea} = \frac{T-B}{S-B} \times 100 \\
\text{(mg/100ml)}
\]

**Serum Creatinine Estimation Test:** By Brod and Sirota method in a centrifuge tube, measure 1 ml serum, 4ml water and add 5ml sodium tungstate and 5ml sulphuric acid, mix by inversion and centrifuge after some time, take 3ml supernatant another tube.

- **Standard** - 3 ml working standard
- **blank** - 3 ml water

Add 1.5 ml alkaline picrate solution to each tube mix well and allow to stand for 10 min, measure the absorbance using green filter against blank.

\[
\text{Serum creatinine} = \frac{T}{S} \times 6 \\
\text{(mg/100ml)}
\]

**Urine Creatinine Test:** Protein precipitation is not done, rest of the method is same as for serum creatinine.

**Estimation of Urinary Protein:** Collect 24 hours urine under proper conditions. We measure 1ml clear urine and mix 4ml 3% sulphosalicylic acid.
Standard - Mix 1ml protein standard with 4ml sulphosalicylic acid.

Blank - 1ml water and 4ml sulphosalicylic acid. Allow all tubes to stand for 10 min, remix the ppt. and measure the absorbance of turbid solution with red filter against the reagent blank.

\[
\text{Urine protein} \quad \frac{T}{S} \times 100
\]

\(\text{mg/100ml}\)

**Hemoglobin Estimation Test**: By cyanmethanoglobin method: The hemoglobin is treated with a reagent containing potassium ferricyanid potassium cyanide and potassium dihydrogen phosphate. The ferricyanide forms metheamoglobin which is converted to Cyanmetheamoglobin by cyanide.

**Serum Electrolyte Estimation Test**: By flame photometric method, estimation of sodium and potassium. Mix 2ml of serum 19.8ml of distal water in a tube, cap the tube with parafin and mix well by inversion, pour it into a polythene cuvette. This is used for sodium and potassium. Note the reading on colorimeter.

The results were recorded in all cases, and put for statistical analysis to make the final results.