# SUMMARY

Critical illness in children might have different etiologies as septicemia – pneumonia or meningitis, but all characterized by any of these paths physiological as hypoxia, shock and coma.

Multiple organ dysfunction include the development of two or more of the following respiratory failure , cardiac failure , renal failure , gastrointestinal or hepatic insufficiency, disseminated intravascular coagulopathy and hypoxic ischemic brain injury. Mortality rate increases with increasing numbers of involved organs.

Markers for kidney injury include urine analysis, proteinuria, glucosurina and aminoaciduria, blood tests (urea, creatinine, creatinine clearance, calcium, phosphate) GFR, radiological investigation (ultrasounds – intravenous urogram – micturating cystourethrogram).

Our study was conducted on 60 subjects, Patients group comprised 44 children (22 boys and 22 girls) admitted to Benha University Hospital PICU and Benha Children Hospital PICU (ministry of health) with age ranging from 2 months to 14 years (mean of cases 30 ± 43.4 months). The control group comprised 16 apparently healthy children matched in age and sex with patient group and they were clinically free from any diseases.

Our study reported that serum urea is insignificant marker for kidney injury in PICU, serum creatinine is significant within normal ranges depends on age and extra renal factors, creatinine clearance better after the third decade to know the corrected values and affected by age, cystatin C depends on age less than one year but beta 2-microglobulin not affected by age throughout life.

Cystatin C is a serum protein that is filtered out the blood by the kidneys and that serves as a measure of kidney function. Cystatin C is produced by type of nucleated cells in the body. Its low molecular mass allows it to be freely filtered by the glomerular membrane in the kidney, is used as alternative to creatinine and creatinine clearance for screening kidney function in those with known or suspected kidney diseases.

Beta 2-microglobulin is a protein found on the surface of white blood cells, normally is filtered out by the blood through kidney's glomeruli. In glomerular kidney diseases, the glomeruli can't filter it out of the blood, so its level increase in the blood & decrease in the urine.

Glomerular filtration rate is difficult to measure in clinical practice, and the parameters (serum creatinine and creatinine clearance) are not the most accurate.

Cystatin C and beta 2-microglobulin are low molecular weight proteins, the serum concentration of which is less dependent on extra renal changes.

In our experience, serum cystatin C and beta 2-microglobulin are confirmed markers, better than serum creatinine; to detect acute kidney diseases in children also Serum cystatin C and beta 2-microglobulin are screening tests in PICUs and may be at the same value, recent, automated and faster than creatinine clearance but very expensive.