Introduction

Critical illness in children might have different etiologies as septicemia, pneumonia or meningitis, but all may lead to one or more of this path-physiological state as hypoxia, shock and coma ***(Hatherill M., 2006)***.

Multiple organ dysfunctions 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 ***(Marcdante K.J., 2006***).

Respiratory failure occurs when the pulmonary system is unable to maintain gas exchange to meet metabolic demands. It is frequently caused by bronchiolitis, asthma, upper airway obstruction, sepsis and ARDS. It may result in cardio-respiratory arrest ***(Marcdante K.J., 2006).***

Shock is inability to provide sufficient perfusion of oxygenated blood to tissues to maintain organ function. Acute hypovolemia is the most common cause of shock in children. Distributive shock, cardiogenic shock, obstructive shock and dissociative shock are other types of shock ***(Marcdante K.J., 2006)***.

Neurological disability is the level of consciousness depressed determined by (Glasgow coma score or AVPU score), evidence of cerebral edema, seizure activity & identify the cause such as trauma, poisoning or a febrile illness ***(Hatherill M., 2006).***

Kidneys are sensitive organs for acute illness. In PICU Kidney injury may result from renal hypo-perfusion that if not corrected it will progress to acute tubular necrosis ***(McCulloch M.I., 2006)***.

Markers for kidney injury include urine analysis, proteinuria, glucosurina and aminoaciduria, blood tests (urea, creatinine, creatinine, clearance, calcium, phosphate) GFR, and radiological investigation (ultrasounds – intravenous urogram – micturating cystourethrogram) ***(Lissauer T., & Clayden G., 2007).***

Cystatin C is a serum protein that is faltered out of the blood by the kidneys and that serves as a measure of kidney function. Cystatin C is produced from nucleated cells in the kidney. Its low molecular mass allows it to be freely filtered by the glomerular membrane in the kidney, so it is used as alternative to creatinine clearance for screening kidney function in those with known or suspected kidney diseases ***(Mocroft., et al., 2009)***.

Beta 2-microglobulin is low molecular weight protein found on the surface of white blood cells; normally it is filtered out by the blood through kidney's glomeruli. Its level not influenced by age or muscle mass. In glomerular kidney diseases, the glomeruli can't filter it out of the blood, its level increase in the blood & decrease in the urine so it may be used in detecting glomerular filtration rate ***(Nordenson N.J., 2006)***.