What is sepsis?

Named by Hippocrates with the meaning of the organic decomposition in 400 BC, sepsis has been long deemed as a life-threatening disease that till now remains to be incurable, with approximately a third of sepsis victims die from this condition and the major cause of death in the Intensive care units (ICU). Under infection, patients that suffer from sepsis may have an unstable immune response, and the excessive amount of chemicals, like cytokines, that triggers a large scale inflammation in the body, damaging organs. Normally inflammation should gradually diminish during the healing process, yet in sepsis, it can occasionally pose further damage to the site of infection. Besides the faulty and harmful cells, they also kill healthy ones that contribute to survival. Blood clots may also be formed during the process, blocking blood flow to organs, resulting in the deficiency of nutrients and oxygen.

Causes of sepsis

It is usually due to exposure of bacterial, viral, fungal, or parasite infection, for example in the lungs, digestive or urinary system, or in the blood. Infection in different parts of the body, such as pneumonia, urinary tract infection, cellulitis, meningitis, etc., potentially lead to sepsis. In some cases, during surgery, such as the Cesarean section, organ transplant to name just a few, one may be exposed to bacteria or virus during incision, hence infection in the wound and development into sepsis.

Symptoms of sepsis

For early stages, one may have mild vital signs, such as increased body temperature, tachycardia, increased respiration rate, and white blood cell count (leucocytosis). There may also be a fluctuation in glucose regulation under a hypermetabolic state and a decrease in venous oxygen saturation and urine output from organ damage.
As the severity increases, one's temperature may drop due to systemic response and vasoconstriction and a rise in venous oxygen saturation with the decreased ability of delivery of oxygen and cardiac output.

What is septic shock and how does it affect the body?

If a sepsis patient receives insufficient treatment or is unresponsive to the treatment, septic shock (a subset of sepsis) may occur. When this happens, there is a massive release of cytokines.

Under normal circumstances during a local infection, bacteria may invade and enter the bloodstream, where it may be encountered white blood cells. The latter would release cytokines, in order to eliminate intruder bacteria by signalling more white blood cells to a certain location. Nevertheless, in sepsis, this infection is omnipresent in the body and this immune response in the contrary may do harm rather than good for these patients. Besides cytokines, white blood cells also release pro inflammatory mediators and nitric oxide, which causes blood vessels to dilate, resulting in a drop in systemic vascular resistance and thus blood pressure in vessels everywhere. These two factors are then further exacerbated by the opening of space between endothelium lining. This action typically occurs during an

If this progresses, the body may not be able to endure such large scale impairment and gradually run out of