Introduction

Hypoxia is defined as complete or partial lack of oxygen to brain or blood ***(Adams and Stoll, 2008)***.

Hypoxic injury results in fetal and neonatal mortality or long term squeal such as cerebral palsy, mental retardation, epilepsy and learning disabilities. In term neonates 1-4% of infants suffer birth asphyxia, one third manifest significant neurological deficits ***(Shadra, 2006).***

The incidence of moderate or severe hypoxic ischemic encephalopathy has remained unchanged over the last 20 years ***(Diaxon et al., 2002).***

Free radicals (FR) are highly reactive chemical molecules containing one or more unpaired electrons. Oxygen-derived free radicals, collectively termed reactive oxygen species (ROS), are normally produced in living organisms. When over production,they are one of the major mediators of cell and tissue injury. There is a critical balance between free radical generation and antioxidant defenses ***(Buonocore et al., 2001)***.

By damaging proteins, lipids, and DNA, free radicals play a role in pathogenesis of diseases such as hypoxic - ischemic encephalopathy (HIE), intra-ventricular hemorrhage (IVH), retinopathy of pre-maturity (ROP), chronic lung disease (CLD), necrotizing enterocolitis (NEC), septicemia and icterus ***(Sharda, 1999).***

Free radical formation and organ damage are associated with intrauterine hypoxia, indicating significant oxidative stress apparently starting from fetal life ***(Sharda, 2002).***

Accordingly, any unfavorable intrauterine environment hindering growth may lead to free radical generation, hence causing oxidative fetal stress

culminating into cellular damage, which begins in utero and manifests after birth ***(Saliba and Henrot, 2001).***

Therefore, an increased release of free radicals in the human fetus and a significant change in markers of oxidative stress occurs during hypoxia/ischemia in prenatal period ***(Sharda, 2002).***

Anti-oxidant defense is made up of intra-cellular and extra-cellular components that work synergistically to prevent oxidative damage ***(Saliba and Henrot, 2001)***.

Three important antioxidant enzymes namely; superoxide dismutase(SOD), gluatathione peroxidase (GPx), and catalase. Catalase is a common enzyme found in nearly all living organisms. Its functions include catalyzing the decomposition of hydrogen peroxide to water and oxygen ***(Wang et al, 2004b).***

Catalase has one of the highest turnover rates of all enzymes; one molecule of catalase can convert millions of molecules of hydrogen peroxide to water and oxygen per second ***(Gaetani et al, 1996).***

It is thus concluded that free radical mediated injury plays a significant role in the pathophysiology of birth asphexia and HIE, leading to up regulation and increased activity of anti-oxidant enzymes to scavenge the free radicals ***(Singh et al, 1999).***

Aim Of The work

Aim of this project is to evaluate the serum catalase level as a diagnostic and prognostic marker of hypoxic ischemic encephalopathy in neonates with perinatal asphyxia.