INTRODUCTION

During the late foetal and perinatal period and during early infancy, major maturational processes and growth of the brain take place, because of this ongoing maturation, the preterm brain in particular is very vulnerable to deviant development and damage ***(Battin and Rutherford 2002).***

Patterns of perinatal brain injury depend not only on the origin of the injury (i.e. traumatic, hypoxic- ischaemic, inflammatory, haemorrhagic) but also on the PCA of the foetus or infant at the time of the event(s) ***(Boxma et al. 2005).***

Preterm birth is a major challenge in perinatal health care. Most perinatal deaths occur in preterm infants, and preterm birth is an important risk factor for neurological impairment, including cerebral palsy. Providing care for preterm infants who may spend several months in hospital has increasing cost implications for health services ***(Tucker &McGuire, 2005).***

Prematurity is the leading cause of neonatal mortality and a major cause of pediatric morbidity and disability, associated with up to one half of all pediatric neurodevelopmental disorders ***(Gray et al., 2004).*** Furthermore, preterm birth and low birth weight (LBW) may also be associated with lifelong chronic conditions, such as hypertension and dyslipidemia ***(Russell et al., 2007).***

Cranial ultrasonography (CUS) was introduced into neonatology in the late 1970s and has become an essential diagnostic tool in modern neonatology. The non-invasive nature of ultrasonography makes it an ideal imaging technique in the neonate. Transfontanellar CUS allows the

use of high-frequency transducers, with high near-field resolution. As a result of ongoing development in ultrasonography, image quality is high nowadays, provided optimal settings and techniques are applied. Therefore, CUS is a reliable tool for detecting congenital and acquired anomalies of the perinatal brain and the most frequently occurring patterns of brain injury in both preterm and full-term neonates ***(Arthur et al , 2001)***.

Sonography remains the cornerstone modality "for imaging intracranial structures in the critically ill premature infant however, in the term or near-term infant MRI has replaced sonography for many clinical indications, recent studies suggest that cranial sonography is highly accurate and sensitive but not specific in the characterization of cerebral lesions in the term newborn ***(Daneman et al, 2006).***

Cranial ultrasound (US) is an established modality for detection of brain injury in very low birth weight infants, the American Academy of Neurology, and Child Neurology Society recommendation is that routine screening cranial US should be performed on all infants of less than 30 weeks ***(Ment et al, 2002).***

Neonatal brain injury occurs most often when hypoxia (decreased oxygen content of blood) and ischemia (reduced blood flow, with diminished oxygen and glucose delivery to the brain) coexist ***(Back et al., 2002).***

Hypoxic ischemia impairs the reuptake of synaptic glutamate, resulting in overstimulation of the postsynaptic receptors. This in turn causes a cascade of cellular damage, ultrasonic examination of the brain in the syndrome of hypoxic ischaemic encephalopathy may reveal haemorrhage and the extent of oedema ***(Raju et al., 2007).***

Preiventricular leukomalacia & germinal matrix haemorrhages are major causes of neurodevelopmental abnormalities in the preterm neonates cranial sonography is widely used to detect these abnormalities and is thought to be sensitive in detecting the larger germinal matrix haemorrhages but has more limited sensitivity in early diagnosis of periventricular leukomalacia ***(Fanaroff, 2002).***

Sonography is helpful in demonstrating the presence and the extension of intracerebral hemorrhages as well as their relationship with the ventricles, however, MRI has been found to be superior to sonography for the identification and characterization of these lesions, great attention must be paid during cranial sonography to infants with a suspicion of hemorrhage without any identifiable cause, because tumors can be associated with hemorrhage ***(Shalak and Perlman 2002).***

Ultrasonic examination is important to detect cranial malformations ***(Rodriguez et al., 2001).***