# Summary and Conclusion

Perinatal asphyxia is a major cause of neonatal mortality and irreversible damage to the brain. Severe asphyxia may induce major deficit shortly after birth, while mild to moderate asphyxia episodes may result in cognitive and attentive disorders later on in development.

There is an urgent need to better understand its pathophysiology and to identify as early as possible reliable indices of brain injury in the asphyxic newborns to apply potential therapeutic interventions at the optimal time and to identify those infants at high risk for developmental delays and disabilities.

Oxygen free radicals are involved in the pathogenesis of perinatal asphyxia and subsequent hypoxic ischemic encephalopathy.

Catalase enzyme is one of the antioxidant enzymes, increased in hypoxic ischemic encephalopathy but unable to scavenge the free radicals.

The aim of the present study is to detect serum levels of catalase in newborns with perinatal asphexia and correlate the level with the severity of insult and thus predict the possible role of catalase in identification of high risk and the possible early therapeutic intervention.

The current study was conducted on 45 full term neonates; all were subjected to full clinical examination, follow up visits and laboratory investigations:

- Blood gas.
- CBC & CRP.
- Serum catalase levels.

The neonates in the present study were classified into two groups:

**Group I (patients group):** This group included thirty term babies with perinatal asphyxia and hypoxic- ischemic encephalopathy (23 males and 7 females) with gestational age 37- 41weeks with mean (٣٩.٠±١.٠٢) wks and birth weight 2.5-3.5 kg with mean (٣.٢±٠.٣٣) kg, classified as grade I, grade II, and grade III according to sarnat classification.

Hypoxic - ischemic encephalopathy was diagnosed using at least three of the following:

1. Evidence of fetal distress (abnormal fetal heart patterns and/or meconium stained amniotic fluid).
2. Apgar score < 7 at 5 minute.
3. Delayed onset of respiration.
4. Umbilical cord arterial pH < 7.2 (profound metabolic acidosis or mixed acidemia).
5. Multiple organ failure.

## Exclusion Criteria:

The following babies were excluded from the study:

Preterm babies, metabolic disease, neonatal sepsis, major congenital malformation, trauma, hemolytic disease, drug exposure and neonatal stroke.

**Group II (control group):** This group included fifteen apparently healthy term babies (6 males and 9 females) with gestational age 37-41weeks with mean (٣٩.٣٣±1.١٨) and birth weight 2.2-3.2 kg with mean (2.٩٨±0.4٢) kg.

Among both groups there was no statistical significant difference as regard sex, anthropometric measures, gestational and maternal age.

Concerning the maternal problems PROM was 30% of cases, MAS was 13.33%, APH, obstructed labour and breech delivery were 10% of cases respectively. Mothers without any maternal problems were 26.67% of cases.

As regarded the mode of delivery 50% of cases were delivered by CS while 60% were delivered by CS among the control group. And 50% of cases were delivered by NVD while 40% were delivered by NVD among the control group.

Concerning the seizures it was present in 53.33% of the cases.

There was a significant change in the mean ± SD of the blood gases parameters among cases when compared to those of the control group and there was a non significant difference in the mean ± SD of Na, K, ALT and AST levels between cases and controls.

There was a highly significant difference in Apgar5 between cases and control.

Catalase levels were significantly higher among patients group compared to control group. There was also statistically significant correlation between catalase level and grade of hypoxia and there was highly statistically significant difference between different grades.

There was a highly significant difference in the mean ± SD of serum catalase levels among cases with seizures when compared to the cases without seizures.

There was a non significant difference in the mean ± SD of catalase among cases delivered by CS when compared to those delivered by NVD.

There was no significant correlation between serum catalase level and the levels of the studied parameters among cases.

There was no statistically significant correlation between catalase level and sex, weight, and gestational age among patients group.

From this study, it is concluded that catalase levels are significantly higher in newborns with perinatal asphyxia compared to healthy neonates.

As regard the prognosis, 43.33% of the cases developed CP, 33.33% dies and 23.33% survived. On the other hand, 100% of the controls. survived.

Measurement of catalase levels may thus have an important role in predicting high risk newborns with asphyxial insult.