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Zinc and iron are trace elements known to be essential for normal growth and development in human. The metabolic function of them are based largely on their presence as an essential component of many metallo enzymes involved in all aspects of metabolism. Inadequate nutrition of zinc and iron alters immunocompetence in humans and experimental animals. For each of these minerals, deficient status leads to increased susceptibility to infection. (Hoffman R, et al , 1990).

Our aim of the work is to study iron and zinc status and their reflection on some immunologic functions in septicemic newborns.

The current study was carried out on 80 neonates selected among neonates attending Neonatal Intensive Care Units at Cleopatra and Manshyet El Bakry Hospitals in Cairo from January 1998 to December 1998 with an age range from 1st day of birth to 28th day after birth.

The study group was divided into the following subgroups :

1- 10 full term septicemic neonates.

2- 10 pre-term septicemic neonates.

3- 10 small for date septicemic neonates.

4- 10 septicemic neonates with respiratory distress syndrome (RDS).

In addition to 10 non septicemic full term neonates and another 10 non septicemic preterm neonates, 10 non septicemic LBW neonates and 10 non septicemic neonates with RDS studied as control groups.

All cases were subjected to the following:

I) Complete clinical examination:

To differentiate septicemic from non septicemic neonates by the following manifestations of septicemia as: hypothermia, fever, general ill health, poor feeding, sclerema, Abdominal distension, vomiting, diarrhea, apnea, tachypnea, retraction, grunting, cyanosis, oliguria, pallor, mottling, cold clammy skin, tachycardia, hypotension, irritability, lethergy, tremors, seizures, hyporeflexia, hypotonia, abnormal moro reflex and jaundice.

And also to differentiate between 4 sub groups :

1- Full term neonates: Babies born after 37 week of gestation.

2- Pre-term neonates: Babies born before 37 week of gestation.

3- Small for date neonate: Babies weight is less than that expected for his age due to intrauterine growth retardation, placental insufficiency or fetal conditions impairing growth which is known by growth curves in which the neonate weight plotted in the curve is less than that expected for his age.

4- Neonates with R.D.S.: They are also neonates with hyaline membrane disease due to deficient surfactant whom develop respiratory distress few hours after birth, they are mostly premature babies, or infants of diabetic mothers or babies born by cesarean section which were diagnosed by X-ray which show diffuse reticulogranular pattern and air bronchogram.

II) Laboratory Investigations:

Complete blood picture and C.R.P. were done for every case in order to prove or disprove whether is he septicemic or non- septicemic. In addition to the following investigations: measurement of serum zinc level, serum iron level, iron binding capacity and transferrin. In addition to measurement of serum

immunoglobulin levels (IgG and IgM) and chemotaxis in order to study the relation between the levels of serum zinc, iron and their relation to humoral and cellular immunity. Results were consequently statistically analyzed and discussed.

Samples were taken at a time of established diagnosis of septicemia by the following procedure: 5 ml. blood samples collected from the cases and the control groups of the study were divided into three portions : one portion was used for CBC, CRP, IgG, & IgM, and the rest was kept frozen for serum examination of iron level, zinc level, TIBC and transferrin level. The third portion was collected on heparin & sent immediately to the laboratory for neutrophil chemotaxis workup.

Our study revealed that there is statistically significant difference between septic and non septic neonates as regard iron, zinc, T.IgG, T.IgM and chemotaxis as there is decreased levels in them in septic than in non septic neonates except in IgM in which there is increased T.IgM in septic than non septic neonates.

There is also no statistically significant difference in TIBC and transferrin between septic and non septic neonates.

There is statistically significant difference between neonates with deficient and with normal iron levels in immunoglobulins as there is statistically significant decrease in T.IgG in iron deficient neonates than neonates with normal iron levels and there is also statistically significant increase in T.IgM in iron deficient neonates than neonates with normal iron levels.

There is statistically significant increased number of septic neonates with iron deficiency in relation to septic neonates with normal iron as 67.5 % of septic

neonates are iron deficient and 32.5 % of septic neonates are with normal iron level which indicate the role of iron deficiency in the development of sepsis.

In our study 71 % of our iron deficient neonates are septic and only 29% of iron deficient neonates are non septic which indicate that sepsis may cause iron deficiency.

There is statistically significant difference between neonates with deficient and with normal zinc level : in iron level, immunoglobulins G&M and chemotaxis as there is statistically significant decrease in iron level in zinc deficient neonates which indicate that zinc deficiency may cause iron deficiency anemia. There is also statistically significant decrease in T.IgG and increase in T.IgM and decrease in chemotaxis in zinc deficient than neonates with normal zinc and there is also 100% of our non septic neonates are with normal zinc level and 100 % of septic neonates are with deficient zinc level which prove the importance of zinc in immunity in the neonates. There is no statistically significant difference between zinc deficient and neonates with normal zinc as regard TIBC and Transferrin.

There is statistically significant increased number of septic neonates with zinc deficiency in relation to septic neonates with normal zinc which indicate the role of zinc deficiency in the development of sepsis.

Our study show the effect of infection on zinc level as 65 % of our septic neonates are with zinc deficiency and 35 % are with normal zinc level which mean that infection can affect zinc by decreasing its level in cases of sepsis. As regard the difference between preterm and full term non septic neonates there is statistically significant difference between them in TIBC, transferrin, T.IgM and chemotaxis which indicate the importance of prematurity in affecting immunological functions with subsequent development of sepsis.