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# Study of Serum Vitamin E level in mothers and their Newborns in West Bengal.

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***Abstract:*** *During pregnancy, There is excessive production of Reactive Oxygen Species (ROS).Vitamin E is a potent antioxidant, scavenging oxygen radical and terminating free radical chain reactions. Vit E deficiency during pregnancy may cause abortion, preterm birth, IUGR and low birth weight babies. The relationship between serum Vit E of mother and theirnewborn remain unknown particularly in tropical country like India. The aim of present study was to determine the conc. of Vit E of mothers and their newborns in West Bengal.*
*50 pair matched bloodsamples were collected from mothers and umbilical cords during delivery. 50 blood samples were also collected from nonpregnant women of same age group. Serum Vit E was measured by colorimetric method. Statistical analysis was done in SPSS-17. P value <0.05 was considered as statistically significant.*
*Vit E was significantly lower in pregnant mother than nonpregnant woman. It was also significantly lower in low birth weight than normal birth weight babies.*

***Keywords:*** *Reactive Oxygen Species, Antioxidant, Vitamin E.*

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## I. Introduction:

Oxidative stress is associated with adverse pregnancy outcome. Numerous evidence about confirming the excessive production of Reactive Oxygen Species (ROS) causing oxidative stress during both normal and abnormal pregnancies(1)(2). Maternal Stress during pregnancy plays a vital role in pathogenesis of chronic diseases in adulthood (3). Maternal and foetal nutritional alterations during in pregnancy may affect foetal development and growth. It may facilitate the incidence of chronic disorders in adulthood. Several micronutrients are important for the health of developing foetus and ingestion of particular micronutrient may cause a shift in oxidative status(4). The micronutrients most relevant to this include vit A,Vit C and Vit E.

Vit E was 1st discovered by Evans and Bishop in 1922 and it was initially denoted as an ‘ antisterility factor X ‘ that was necessary for reproduction(5). Since then vit E has been well characterised as a powerful lipid soluble antioxidant through extensive research. The antioxidant activities of vit E were reported following findings on its ability to scavenge ROS on cellular membrane(6)(7)(8). It is a potent chain breaking antioxidant, scavenging oxygen radicals and terminating free radical chain reactions(9). It is well recognised for its role in maintaining membrane integrity and protection from ROS(10).Vit E deficiency during pregnancy may cause abotion, preterm birth and IUGR,low birth weight babies(11). Vit E also acts on germinal epithelium and deficiency causes infertility, red cell fragility and muscular dystrophy.Vit E deficiency also causes defective lipid absorption and transport(12). Studies have shown that placental transfer of vit E occurs but limited(13)(14). Infants are relatively deficient of vit E at birth because of limited placental transfer. Healthy term infants achieve vit E sufficiency shortly after birth. However IUGR or preterm infants are at risk for continued vit E deficiency because of greater requirements for vit E secondary to intestinal malabsorption and rapid postnatal growth(15).

The relationship between serum vit E of mother and their newbornremain unknown particularly in tropical country like India. Besides the effect of this vitamin in birth outcome remain controversial. Therefore the aim of this present study is to determine the conc. serum Vit E in mothers and their newborn babies in West Bengal.

## II. Materials and Methods:

Pregnant women who attended the antenatal clinic of IPGME&R in Kolkata were recruited for this study. The research protocol was approved by the Institutional Ethics Committee. The informed consent and

approval of all the subjects were obtained. The no of subjects were pair matched: 50 pregnant women during delivery and their 50 newborns. Inclusion criteria for the pregnant women were the age group of 20-35 yrs without any complications during pregnancy. History of any chronic diseaseor any complications during pregnancy were excluded from the study group.50 nonpregnant apparently healthy women within the same age group were taken as our control group to compare the serum vit E level between pregnant and nonpregnant women. For newborn infants inclusion criteriawere birth weight varying from 1.85-3.25 Kg, Apgar score at 5 min and postnatal behaviour within the acceptable limit of normalcy. 50 pair matched mother and their infants were selected during delivery at labour room.

Venous bloodof mothers were collected at the time of delivery and in cases of newbornsthe samples were collected from umbilical veins.Vit E was determined by colorimetric method( Quaife et al. 1949 ). Fresh serum Vit E was extracted into Xylene layer and reacted with α-α dipyridyl to form a reddish brown complex which at 520 nm the intensity correlates with the conc.of vit E.

Statistical calculation was done in SPSS-17 and $p < 0.05$ was considered as statistically significant.

**Table I. Plasma level of vitamin E in pregnant and non-pregnant women**

| | Mean (mg/100 ml) | S.D | T value | p-level | Significance |
|---|---|---|---|---|---|
| Pregnant Women (n=50) | 1.09 | 0.20 | | | |
| | | | 3.85 | p<0.001 | Highly Significant |
| Non-pregnant Women (n=10) | 1.25 | 0.09 | | | |

S.D = Standard deviation

**Table II. Plasma vitamin E level in normal and underweight new borns**

| | Mean (mg/100 ml) | S.D | T value | p-level | Significance |
|---|---|---|---|---|---|
| Normal weight Newborns (n=41) (2.5 kg and above) | 0.35 | 0.09 | | | |
| | | | 0.08 | p<0.05 | significant |
| Low weight Newborns (n=9) (Less than 2.5 kgs) | 0.34 | 0.20 | | | |

**Table III.Vit E level of mother of normal birth weight & low birth wight babies.**

| | Mean (mg/100 ml) | S.D | T value | p-level | Significance |
|---|---|---|---|---|---|
| Mother of NBW babies | 1.11 | 0.02 | | | |
| | | | 0.08 | p<0.05 | Insignificant |
| Mother of LBW babies | 0.99 | 0.09 | | | |

## III. Result and Discussion:

The new born babies were divided into two groups: normal and low birth weight group. Babies birth weight more than 2.5 kg were considered as group 1 and birth weight less than 2.5 kg were considered as group ll. There were 41 babies in group 1 and 9 babies in group ll.

Table l shows vit E level in pregnant and nonpregnant women.Serum vit E level in pregnant and nonpregnant women were 1.09 ±0.2 and 1.25±0.09 respectively. Serum vit E was significantly lower ($p<0.001$) in pregnant women.

Table ll shows vit E level innormal and low birth weight babies. Vit E level of normal and low birth weight babies were 0.35±0.09 and 0.34±0.20 respectively. It was significantly lower ($p<0.05$) in low boirth weight babies.

Vit E level of mothers of normal birth weight and low birth weight babies were 1.11±0.02 and 0.99±0.09 respectively. It was significantly lower ($p<0.05$) in mother of low birth weight babies.

From the above observations it is concluded that serum vit E level was significantly lower inpregnant mother than nonpregnant woman. It was also significantly lower in mothers of low birth weight babies andalso significantly lower in low birth weight babies.

## IV. Conclusion:

Vit E has received much attention in recent years due to its ability to improve reproductive health. Vit E has been reported to exert beneficial effects as an antioxidant against the reproductive disorders. Many future studies are required forunderstanding of this antioxidant vit E with bigger sample size.

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