COVID-19 pandemic and hemorrhagic shock: A case report

A case report describes a 35-year-old female patient who presented with severe hemorrhagic shock due to COVID-19. The patient exhibited symptoms of acute respiratory distress syndrome (ARDS) and hypotension. The medical team administered supportive care and transfusions to manage the hemorrhagic shock. However, the patient passed away within 24 hours. This case highlights the critical nature of COVID-19 management and the potential for hemorrhagic shock in severe cases.
will probably depend on when the Hb is measured. Pregnant women with Hb levels below 11g/dl are at higher risk of LBW. The normal Hb concentration in the body is between 12-14 gm%. During pregnancy, plasma volume increases by 50%, there is a consequent fall in Hb concentration, hematocrit and red cell count because of haemodilution called physiological anemia of pregnancy but, low concentration of Hb which causes anemia in pregnancy, because haemodilution is a main factor to aggravate anemia is a significant cause of morbidity and mortality, both for pregnant mother and her fetus  and about 16% to 40% of maternal deaths occur due to anemia. Some studies showed a significant association between abnormal level of maternal Hb concentration and adverse pregnancy outcomes in the form of low birth weight (LBW) babies, preterm delivery, perinatal death, intrauterine growth restriction and the fact is at a higher risk of early childbearing. This supports the fact that poor placental and neonatal development is due to inadequate oxygen supply to fetus across the placa. Pregnancy is associated with increased demand of all the nutrients like protein, iron, copper, zinc, etc. Trace elements is needed in minute quantities are essential for development and normal function of the body as well as for healthy fetal outcome. A deficiency of one micronutrient is often associated with deficiencies of others, which may lead to reduced concentration of hemoglobin during pregnancy. Deficiency of these may cause various reproductive health problems, as a consequence of LBW & increased risk of infant mortalities may occur.

Major nutrients like protein is a host of micronutrients play a significant role in vital process of growth. Protein are vital to every part of the human body are found in bones, muscles, skin, and nearly every vital organ or tissue. Protein must be consumed through food, for proper functioning and survival to the body. So, deficiency of these may affect pregnancies, delivery, outcome and strongly affect fetal growth as well as length of gestation. Hypoproteinemia during pregnancy have shown to have serious implications on the developing foetus. Birth weight is a strong indicator not only of the mothers health and nutritional status but also of the newborn's baby for survival, growth and development. Neonates are presence with fetal growth retardation is major cause of infant mortality and is considered as a sensitive index of nation health and development. The low birth weight neonates have a number of neonatal problems like hypothermia, inability to suckle the breast, asphyxia, sepsis, infection, hypoglycemia etc.

The prevalence of LBW is higher in Asia than elsewhere. In India, prevalence of low birth weight babies is 21.5%. In Bangladesh, LBW the causes of preterm related neonatal mortality is 30% is recognized to be contributory to under nutrition of the fetus.

**Materials and methods**

The present cross sectional study was carried out in the Department of Physiology, Sir Salimullah Medical College, Mitford Hospital, Dhaka. A total number of 108 subjects were included in this study. Among them 27 were neonates (<37wks) (study group) and another 27 were neonates (>37wks) (control group) of their respective mother. Pregnant mother were selected on the basis of defined selection criteria. All the participants were belonged to lower and lower middle socio-economic status. All the neonates were collected from emergency labor ward in Sir Salimullah Medical College, Mitford Hospital. Detail personal, dietary, medical, family, socio economic, occupational histories were taken of those mother and a thorough clinical examination were done and all information’s were recorded in a standard prefixed questionnaire. Five (5) ml of neonatal blood were collected from placental end of cord immediately after delivery. Blood was centrifuged at 3000 rpm for 20 minutes. The statistical analysis was done by Independent-samples t test and by using SPSS, Version-15.

**Ethical clearance:** Prior the submission, this research study was approved by the Ethics committee of Sir Salimullah Medical College, Mitford, Dhaka.

**Results**

The anthropometric data of the subjects are presented in Table-I

This table shows that mean serum hemoglobin levels were significantly (p<0.01) higher in gestational age <37weeks (preterm mother) in comparison to gestational age >37weeks (full term mother). On the other hand, mean serum total protein level were significantly (p<0.001) lower in gestational age <37weeks (preterm mother) than those of gestational age >37weeks (full term mother). Again, these values were significantly (p<0.001) lower in neonates of gestational age <37wks in comparison to those of gestational age >37wks neonates of their respective mothers. Furthermore, table shows that APGUR...
score both at 1st and 5th minute (≥8) and birth weight (≥2.5kg) were significantly (p<0.001) lower in neonates of gestational age<37weeks than that of, gestational age>37weeks neonates of their respective mothers.

Table I: Hemoglobin (Hb) Serum total protein, in different groups (n=108)

| Groups         | Hb (g/dl) | Total Protein (g/dl) | APGAR Score | Baby weight (kg) |
|----------------|-----------|----------------------|-------------|-----------------|
|                |           |                      | At 1st minute | At 5th minute   |                 |
| Group A_1      | 8.89 ± 0.65 | 7.40 ± 1.52          |             |                 |
| Group A_2      | -         | 6.02 ± 1.50          | 8.04 ± 1.02  | 8.70 ± 0.67     | 3.03 ± 0.31     |
| Group B_1      | 9.36 ± 0.34 | 5.35 ± 1.21          |             |                 |
| Group B_2      | -         | 3.76 ± 0.62          | 6.59 ± 1.12  | 7.63 ± 1.21     | 2.22 ± 0.25     |

p value

A_1 vs B_1: 0.002*  <0.001*
A_1 vs A_2: -  0.002*
B_1 vs B_2: -  <0.001*
A_2 vs B_2: -  <0.001*  <0.001*  <0.001*

Data are expressed as Mean ± SD. p value was done by unpaired “t” test. n = Total number of subjects.

s = Significant

Group A_1 = Gestational age >37 weeks of pregnant mother
Group A_2 = neonates of the respective delivery mother
Group B_1 = Gestational age <37 weeks of pregnant mother
Group B_2 = neonates of the respective delivery mother

Graph-I showed, no linear correlation between maternal hemoglobin concentration with birth weight of their respective neonates in both study and control group separately.

Graph-II, III showed, maternal serum total protein concentration were positively correlated with birth weight of their respective neonates in control group(GA>37weeks), and maternal serum total protein concentration were negatively correlation with that of birth weight of their respective neonates in study group(GA<37weeks).

Discussion

In this study, lower level of Hb and TP have been observed in study group. Again, Low birth weights (LBW) have been documented in this group of neonates. These findings are consistent with those
Low level of serum Hemoglobin concentration associated with neonatal birth weight

Figure-III: Correlation & regression of total protein of neonates with their birth weight

Mean serum Hb and TP concentration in group A1 (control mother) and group B1 (study mother) was significantly lower (p<0.001) than group B2 (study mother & their neonates). Study shows, Hb concentration and TP level in this study group decreased due to inadequate plasma volume expansion, may increase blood viscosity, which lead to poor placental blood flow and poor nutrient delivery to fetus, thus limiting the fetal growth. However, in the present study, lower concentration of Hb and TP level in this study group may be due to inadequate dietary intake. Poor fetal outcome as evidenced by, LBW-birth weight <2.5kg, poor APGUR score <7 at 1st & 5th minute. Again, LBW of neonates (GA<37 wks) in this study may be due to, reduced level of maternal Hb and low plasma protein status in neonates as evidence by their measured values in cord blood. This reduced level of Hb is due to low maternal consumed diet as evidenced by the negative correlation of maternal serum Hb, total protein, with that of neonatal blood. However, the exact mechanism involved for the LBW of neonates & poor outcome due to reduced level of these in the blood. Again, poor socio background of the study subjects indicates that the observed hypoprotenaemia is most likely due to its low dietary intake which is evident from their dietary history. Increased metabolic demand during pregnancy also likely to be an additional factor is responsible for this hypoprotenemia in the subjects of the present series. In addition, increase dietary intake of grain may be attributed to reduced Hb level as all the subjects of the present study had history of high dietary intake of cereals.

Therefore, this study revealed that lower concentration of maternal Hb and low plasma concentration in cord blood may have higher risk of early childbirth(<37wks) and LBW.

Conclusion

Inadequate dietary intake and increased metabolic demand both for mother and the fetus are mainly responsible for low level of Hb in relation with TP concentration in pregnant mother and thereby causing development of low birth weight and malnourished fetus. From the present study it may be suggested that, improve dietary intake(protein containing diet) with supplementation of some micronutrients during pregnancy can be given to maintain normal maternal Hb concentration & increase protein binding availability should be regarded as optimal for fetal
growth and well-being associated with the lowest risk of low birth weight.

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**Conflict of interest:** None declared

**Authors’ contribution:**

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