

Aetiology of LBW and Prematurity

The same factors, in most instances, will cause intrauterine growth retardation or restriction (IUGR) causing LBW and shorten gestation (causing premature birth).

I. Complications During Pregnancy:

1. Hypertension: It can happen with or without proteinuria (pre-eclampsia or essential hypertension). It can be associated with or lead to placental abnormalities. These conditions may lead to both IUGR & pre-term delivery.
2. Diabetes Mellitus: sometimes pregnancy is terminated before 37 completed weeks of gestation, to protect the vitality of the infant. This will lead to the birth of a pre-term infant.
3. Heart Diseases: associated with pre-term delivery, which is sometimes induced.
4. Anaemia: associated with LBW and pre-term delivery.
5. Infections: during pregnancy are associated with fever, immunological reactions, and release of toxic substances. The damage caused is related to the infectious agent, the timing of the infection and the organs or tissues involved. These infections may be:
 - a. Viral: rubella, cytomegalovirus, and herpes.
 - b. Bacterial: can either be amniotic fluid infections (ascending antenatal bacterial infections, which are the most common, are associated with protein energy malnutrition and heavy physical work and lead to preterm delivery), trans-placental infections (TB or syphilis which cause placental insufficiency and preterm delivery), or urinary tract infections (UTIs which are associated with preterm delivery).

- c. Parasitic: congenital malaria is very rare as the foetus is protected by trans-placentally transmitted antimalarial antibodies, and the LBW and preterm delivery are caused by the associated fever and severe anaemia; and toxoplasma (which is associated with pre-term delivery and congenital malformations rather than LBW).
6. Cervical incompetence: may be also associated with infections and lead to preterm delivery.
7. Uterine abnormalities: congenital malformations of the uterus and fibromyomas can lead to preterm delivery.
8. Polyhydramnios: is associated with preterm delivery.
9. Premature rupture of the membranes: is associated with preterm delivery.
10. Antepartum haemorrhage: is associated with foetal growth retardation and preterm delivery.
11. Placental factors: the small placenta and the diseased placenta (abruptio placentae and placental infarcts) are both associated with IUGR.
12. Amniocentesis: is associated with infections and preterm delivery.
13. Maternal surgery: abdominal surgery may lead to preterm delivery.
14. Trauma: may lead to preterm delivery.
15. Iatrogenic: incorrect estimation of the gestational age may lead to preterm induction of labour.

II. Multiple Pregnancy: BW and GA decrease with increasing number of foetuses, leading to a higher incidence of LBW and preterm delivery in a multiple pregnancy. There is also a high incidence of placental abnormalities in multiple pregnancies.

Table (8): Percentage of LBW and Prematurity of All Births in Single and Multiple Pregnancies

Abnormality	Single	Multiple
LBW (% of all births)	7%	54%
Prematurity (% of all births)	5%	26%

III. Congenital malformations: More LBW and preterm deliveries are found in newborns with congenital malformations. This is especially true in chromosomal abnormalities and serious congenital malformations (cardiac and cephalic).

IV. Sex of the Infant: LBW is higher in female infants, while preterm deliveries are higher in the male infant.

V. Biological Factors:

1. Maternal age: more LBW and preterm births happen before 20 years and after 35 years of age.
2. Maternal height: more LBW in shorter mothers.
3. Maternal weight: low pre-pregnancy weight, low weight gain during pregnancy and low quality diets are associated with LBW.
4. Parity: increased chance of LBW in first and after the 4th birth.
5. Short spacing: increased chance of LBW and preterm delivery.
6. Drugs and alcohol:
 - a. Medicinal drugs: some are teratogenic and may lead to IUGR.
 - b. Narcotics: decrease food intake leading to maternal under-nutrition and IUGR.
 - c. Alcohol: is teratogenic leading to LBW and foetal alcohol syndrome.
2. Poor antenatal care: increased chance of LBW and preterm delivery.
3. Previous LBW: increased chance of LBW and preterm delivery.

4. Residence: Increased LBW in rural areas and in higher altitudes.
5. Occupation and physical activity: occupations characterized by hard physical work are associated with a higher chance of LBW and preterm deliveries especially in developing countries.
6. Psychological stress: is associated with preterm labour.
7. Genetic factors: about 40% of the variation in birth weight is attributed to genetic factors (ethnic and familial).

VI. Socioeconomic Factors: Low social status, low family income, low educational level and some husband's occupations may lead to poor maternal nutrition which is associated with LBW.

VII. Cigarette Smoking: Smoking depresses appetite leading to under-nutrition, it has a direct toxic effect of the foetus, it decreases placental perfusion (vaso-constrictive effect of nicotine), and causes hypoxia due to the accumulation of CO in the maternal blood. This will lead to LBW, the degree of which is dose related. One should not forget the role of passive smoking on pregnant women and their foetuses.

VIII. Idiopathic Pre-Term Labour

Effects of LBW and Prematurity on the Foetus

Of all those prematurely born foetus, and those born with a low weight, 50% will die during the first 24 hours, 15% will die during the second day. Fatality increases with decreasing gestational age at birth.

Causes of Morbidity and Mortality:

- **Immediate:**
 1. Respiratory: asphyxia, apnoea and RDS.
 2. Neurological: intra-cranial haemorrhage.
 3. Cardiovascular: bradycardia and hypotension.

4. Haematological: anaemia and bleeding tendency.
5. Nutritional and gastro-intestinal: feeding problems.
6. Metabolic: hypocalcaemia and hyperbilirubinaemia.
7. Renal: Lower GFR.
8. Temperature regulation: hypo and hyperthermia.
9. Immunity: increased risk of infections.
10. Ophthalmic: retrolental fibroplasia and blindness.

- **Long Term:**

1. CNS dysfunction.
2. Chronic lung diseases.
3. Poor growth.

It is estimated that 22% of all infants in Iraq are born with LBW.