

Review article

Epidemiology and pathogenesis of Preterm labor: Review

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Abstract:

Preterm parturition is a leading cause of neonatal morbidity and mortality. Despite of significant advances, in perinatal care that have resulted in improved survival and a decrease in neurological Sequelae. Ascending amnio-chorionic-decidual infection and inflammation promote local endotoxin and inflammatory cytokines (IL-1&TNF) production to enhance the prostanoid expression in the amnio-chorion and decidua. These cytokines also enhance amnio-chorionic and decidua IL - 6 expression which initiates prostanoid, leukotricne and endothelin production to cause uterine contraction. The events of parturition, which occur at occur at term are similar to those, which occur during preterm labour, but they occur earlier. The factors responsible are still unknown. Despite of significant advances in perinatal medicine during the last decade s preterm birth remains to be heading cause of neonatal motility and morbidity representing on of the most unresolved issue of obstetrical care. So research has been made in identifying women who are at increased risk of delivering the preterm infants, so that prematurity could be addressed to them.

Keywords: Preterm labour , epidemiology, neonatal morbidity

Introduction:

Preterm parturition is a leading cause of neonatal morbidity and mortality. Despite of significant advances, in perinatal care that have resulted in improved survival and a decrease in neurological Sequelae. ¹Recently a number of authors have emphasized the concept of heterogeneity of causes of preterm birth. Since ancient time it has been known that infants weighing considerably less than expected weight have an increased of risk of death's and thus infants born preterm might be put in the deprived category even before it has come to an independent existence. The birth of a healthy full term child is the main aspiration of a mother who nourishes her own being in her womb with utmost care. Successful normal delivery brings the woman's marital security, family status and esteem in her community.²

Pathogenesis of preterm Labour :

Ascending amnio-chorionic-decidual infection and inflammation promote local endotoxin and inflammatory cytokines (IL-1&TNF) production to enhance the prostanoid expression in the amnio-chorion and decidua. These cytokines also enhance amnio-chorionic and decidua IL - 6 expression which initiates prostanoid, leukotricne and endothelin production to cause uterine contraction.³ Inflammatory cytokines also enhance expression of amnio-chorionic, decidua, and extracellular matrix (ECM) degrading proteases such as collagenases and promote IL - 8 production, leading to the recruitment of Polymorphonuclear leucocytes and release of potent ECM-degrading elastase which in turn leads to further cervical changes, separation of chorion from deciduas leads to premature rupture of membranes.⁴ Maternal and fetal stress can result in the release of various adrenal and hypothalamic "stress hormones" which enhances placental decidua CRH expression. Acting as a paracrine effector, CRH enhances amnio chorionic-decidual prostanoid production to stimulate contractions. Increased expression of physiological initiators of parturition (e.g. CRH, oxytocin and local

progesterin withdrawal) may occur earlier in gestation by chance leading to enhanced protease and prostanoid production. Reduced uterine blood flow secondary to decidual vasculopathy may cause utero placental ischaemia leading to local tissue damage promoting endothelin, prostanoid and protease production.⁵

Decidual hemorrhage may lead to utero placental vascular insufficiency and fetal hypoxia to enhance fetal placental CRH release; promote macrophage recruitment with cytokine release; or act directly to stimulate decidual protease and prostanoid via production via thrombin generation.⁶

EPIDEMIOLOGY OF PRETERM LABOUR.

The events of parturition, which occur at term are similar to those, which occur during preterm labour, but they occur earlier. The factors responsible are still unknown.

There are four main events that result in preterm birth, Denis M:⁷

1. Preterm labour
2. Preterm PROM,
3. Fetal demise.
4. Maternal medical.

Meis et al⁸ in the study concluded that differences in clinical presentation leading to preterm birth depend on population group studied.

Risk of preterm delivery only 32% cases were due to preterm labour with advance cervical dilatation, failed tocolysis or PPRM.

1. DEMOGRAPHIC FACTORS⁷

- a. Maternal Race- Black women are at least twice more, likely to deliver a low birth weight baby than white. (Report of secretaries Task force²⁷) preterm rate in black women 16.5% and 7.7 in white.
- b. Age- Teenage and > 37 Yrs having high risk of preterm labour, by Baird et al²⁸, Macdonald and Maclesnan²⁹, and Booth & Williams³⁰ have all contributed to this subject.
- c. Social status and economic level - Rate of preterm birth is high in lower social economic group, as shown by Miller⁹.

2. BEHAVIOURAL FACTORS

- a. Cigarette smoking lead to IUGR also increases risk of preterm labour (Meyer MS¹⁰).
- b. Low pre-pregnancy weight. (Miller et al¹¹)
- c. Physical activities- It is found that perinatal mortality is more common in urban who work during pregnancy than women at home

Coitus during pregnancy,

Goodin et al¹² found that the incidence of orgasms after 30 wksof gestation increased incidence of preterm delivery.

Mamelleetal¹³ (1984) Combined certain aspects of paid employment into a fatigue index (0-5).

Women who spend > 8 hrs / day standing and lifting of heavy weight approximately during 28 weeks and more likely to give birth before 37 completed weeks.

3. HEALTH CARE-

Risk of preterm labour is more in women with absent or inadequate prenatal care. Greenberg¹⁴ (1977) showed that prenatal care had greater impact on pregnancy outcome, especially in women with low social status.

4. **MATERIAL CONDITION-**¹⁵

- a. History of previous preterm birth is associated with increase risk of preterm labour -17-40 %
- b. Women with uterine malformations are also at greater risk of preterm delivery Heinonen P et al³⁸
- c. Cervical incompetency- risk factors were known from years. Pathophysiological factors that directly connect risk factors to preterm labour are not understood.
- d. Anemia- liberman et al (1988) found that hematocrit level <34% a high risk of preterm labour.
- e. Multiple pregnancy- this is out of the important factor leading to preterm birth almost Bienar et al
- f. Fetal (and placental) pathology- Neural tube defect and unborn error of metabolism such as hyperalaninemia are found to be associated with preterm labour

5. **MEDIATING FACTOR KNOWN -**¹⁶

- a. ***Cervical, vaginal & amniotic fluid infection***

Dr Romero and Mazor⁴² showed *evidence of* colonization of birth canal, cervix, infection of amniotic membranes & amniotic fluid increase risk of preterm labour

Growingevidence suggests that intrauterine infection is associated with preterm labour. Bobitt and Ledger¹⁷ in 1979 first suggested amniotitis may be related to preterm labour.

Prostaglandin synthesis in the setting of bacterial infection may be by stimulation of bacterial or host signals secretes in response to microbial preserve. Colonization of genitourinary tract with several microorganisms

Hasbeen associated with prematurity and Kass⁴⁴(1960) promised thata symptomatic bacteriuria was related to prematurity and its treatment would reduce the incidence of prematurity. Marlin et al¹⁸ (1987) reported that there is relationship between prematurity and cervical colonization with chlamydia trachomatis. Colonization with chalmydia mycoplasma hominies and ureaplasma urealyticum as a cause of preterm labour was studied but no incidence of prematurity was noted.

- a. ***Uterine contractility-***

Increased frequency of uterine contractions leads to preterm labour or it is a marker of early morphological maturation of uterus (such as developing myometrial gap junction) is unclear, Araki R¹⁹ (19&4)

- b. ***Psychological stress-***

Stress increases maternal catecholamine release from adrenal medulla. It stimulates a receptors & p-receptors. Stimulation of alpha receptors causes muscle contractility

Thus the timing of exposure and chronicity of stress may both contribute to onset and duration of labour.

- c. ***Failure of plasma expansion***

Goodlin RC³⁴ in his study showed that almost 60% women from 22 study group with preterm labour had plasma volume measurements less than 3 SD) of normal pregnant women. It is also found that 50 % of women with preterm labour respond to bed rest and hydration.

PREDICTION OF PRETERM LABOUR : ^{20, 21}

Despite of significant advances in perinatal medicine during the last decade s preterm birth remains to be heading cause of neonatal motility and morbidity representing on of the most unresolved issue of obstetrical care. So research has been made in identifying women who are at increased risk of delivering the preterm infants, so that prematurity could be addressed to **them** It has been claimed by Wood et al⁵³ (1965), it could be predicted monitoring the state of cervix and uterus after 2nd trimester but, Anderson⁵⁴ (1990), showed that this was not specific enough to do anything more than to identify a group of women comprising some 30% of population.

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