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IS PREMATURE BIRTH THE SIGN OF PREMATURE DEATH ?
WOW! MOMS-SAY BIG NO TO CESAREAN SECTION

Microbiology

M.V.Raghavendra Rao* Avalon University School of Medicine, Curacao, Central America. *Corresponding Author

Meka.Balaramiah Professor of Microbiology and Immunology, Avalon University School of Medicine (AUSOM),Sta. Rosaweg 122-124

Sireesha Bala Professor of Microbiology and Immunology, Dean of Student Affairs & Research Director, Avalon University School of Medicine (AUSOM), Sta. Rosaweg 122-124

ABSTRACT

PREMATURE BIRTH IS THE SIGN OF PREMATURE DEATH . Where there is wild fire, there is smoke. These babies born too soon like feast today and famine tomorrow. Premature birth infants (PMB) suffer from sure lethal diseases. Preterm birth, also known as premature birth, is the birth of a baby at fewer than 37 weeks gestational age. These babies are known as preemies or premmies.(1) Preterm birth and low birth weight remain the most important predictors of perinatal morbidity and mortality among otherwise healthy infants. Despite the increasing survival of preterm infants due to the improvement in skills and technologies used in their management, the incidence of preterm birth continues to increase globally. Many risk factors have been proven to be causative, while others remain under speculation needing ongoing research. Previous history of preterm birth remains by far the most accurate predictor of risk for subsequent preterm delivery.

Premature infants are at greater risk for cerebral palsy, delays in development, hearing problems, and vision problems like crossed eyes, near sightedness, retinopathy of prematurity (ROP). According to study 10% American babies have problem with brain such as autism, attention deficit, hyper activity disorder and cerebral palsy. Infants born prematurity or those who demonstrate poor fetal growth are at an increased risk of developing (ADHD) attention deficit hyper activity dis order.(2)

The cause of preterm birth is often not known. Risk factors include diabetes, high blood pressure, being pregnant with more than one baby, being either obese or underweight, a number of vaginal infections, tobacco smoking, and psychological stress, among others It is recommended that labor not be medically induced before 39 weeks unless required for other medical reasons. The same recommendation applies to cesarean section.(3)

According to the March of Dimes, most babies born at 32 or 33 weeks weigh 3 to 5 pounds. If a baby is less than 4 pounds, he is automatically placed in the neonatal intensive care unit and will remain there until he weighs 4 pounds. Therefore, feeding becomes priority number one to help the newborn gain weight. The preemie baby must demonstrate steady, continuous weight gain over several days to a week. The weight is a potential danger because premature babies have insufficient body fat needed to sustain their body temperature. Delivering a baby between 32 and 34 weeks poses even more risks for learning and behavioral problems because brain development is incomplete and preterm babies are more likely to developmental delays.Premature babies are more at risk for developing infections because of their underdeveloped immune systems. Because they usually require medical and surgical exposure, there are multiple ways an infection can attack the baby, from a surgical incision to a feeding tube or respirator.(4)

KEYWORDS

Nifedipine ,Attention deficit hyper activity dis order(ADHD) , Retinopathy of prematurity (ROP). "Caesarean birth." Pre-eclampsia,

INTRODUCTION-

Human pregnancy normally lasts 40+_2 weeks and most newborns weigh 3300+_60gms.The W.H.O defines prematurity as a gestational age under 37 weeks,(Timed from the first day of the last menstruation.)PMB can be further sub-categorized as late preterm delivery- 34 to 36 completed weeks gestation, moderately preterm- 32 to 34 completed weeks, very preterm- less than 32 weeks, and extremely preterm- less than 28 weeks gestation.

Traditionally, prematurity signifies a birth weight below 2500 gms, regardless of gestational age.

The organs most commonly affected by preterm delivery are the lungs, as the lungs are one of the last organs to develop in utero. Preterm birth is also the most important determinant of short and long term morbidity in infants and children, and can have serious long term health consequences, such as cerebral palsy, blindness, developmental difficulties, including cognitive, sensory, learning and language deficits (5). The younger the gestation, the greater the risk of severe morbidity. In the United States, there has been a 21% rise in the rate of preterm births since 1990, which peaked in 2006 with 12.8% of all 4 million annual live births born at less than 37 weeks of gestation The incidence in Europe and other developed countries lies between 5-9% (6). East Asian and Hispanic women typically have a low pre-term birth rate. 74 Preterm Birth - Mother and Child indicated preterm delivery of artificially conceived multiple pregnancies, which account for 15-20% of all pre-term births (6),

Prematurity is often associated with severe respiratory distress, metabolic disturbances, circulatory problems and bacterial sepsis. Premature babies delivered by either emergency or elective cesarean section-equally suffer from above complications. Emergency C.S- is mandatory in the event of mother's or baby"s life is in imminent danger, but should be discouraged in some women request C.S. with their first baby to avoid labor or to take advantage of the convenience of a planned delivery.

Several factors have been identified that are associated with preterm birth. These include intrauterine inflammation/ infection, uterine over distension, utero placental ischemia / hemorrhage, and stress. However, an association does not establish causality. Mothers exposed to high levels of psychological or social stresses are at increased risk of pre-term birth. Additionally, exposure to severe life events, has also been linked to very and extremely pre-term births. Clinical depression, possibly due to its associated increase in smoking, alcohol and drug use also plays a role in increasing pre-term birth as mediated by these behaviors. Tobacco use alone increases the pre-term birth rate by almost 2 fold, due to the associated increased risk of small for gestational age and placental abrupt ion. There are also marked ethnic differences in the incidence and etiology of preterm birth, with African American women being consistently at increased risk of preterm birth compared to native white women. As the cause of labor still remains elusive, the exact cause of preterm birth is also uncertain. Approximately 30–35% of preterm births are indicated or iatrogenic due to medical or obstetric complications, 40–45% are related to spontaneous preterm labour, and 25–30% to preterm pre labor rupture of membranes (PPROM). Spontaneous pre-term birth is most commonly caused by pre-term labor in Caucasians, and PPROM in black women indicating the existence of potentially different causative mechanisms involved in the psycho social associations of preterm birth are not well understood. Research on psycho social factors and preterm birth has accumulated rapidly in recent years. Some psycho social factors implicated in the etiology of preterm birth include major life events, chronic stress, maternal anxiety, personal racism, and lack of support (7)

HISTORY-

The Roman Lex Regia (royal law), later the Lex Caesarea (imperial law), of Numa Pompilius (715–673 BC)(12) required the child of a mother dead in childbirth to be cut from her womb(13)There was a cultural taboo that mothers not be buried pregnant(14) that may have reflected a way of saving some fetuses. Roman practice requiring a living mother to be in her tenth month of pregnancy before resorting to the procedure, reflecting the knowledge that she could not survive the delivery(15) Speculation that the Roman dictator Julius Caesar was born by the method now known as C-section is apparently false(16) Although Caesarean sections were performed in Roman times, no classical source records a mother surviving such a delivery(12) (16)As late as the 12th century, scholar and physician Maimonides expresses doubt over the possibility of a woman's surviving this procedure and again falling pregnant(17)The term has also been explained as deriving from the verb caedere, "to cut", with children delivered this way referred to as caesones. Pliny the Elder refers to a certain Julius Caesar (an ancestor of the famous Roman statesman) as ab utero caeso, "cut from the womb" giving this as an explanation for the cognomen "Caesar" which was then carried by his descendants(18)Nonetheless, even if the etymological hypothesis linking the caesarean section to Julius Caesar is a false etymology, it has been widely believed. For example, the Oxford English Dictionary defines Caesarean birth as "the delivery of a child by cutting through the walls of the abdomen when delivery cannot take place in the natural way, as was done in the case of Julius Caesar(19) Merriam-Webster's Collegiate Dictionary (11th edition) leaves room for etymological uncertainty with the phrase, "from the legendary association of such a delivery with the Roman cognomen Caesar(20)

Some link with Julius Caesar or with Roman emperors exists in other languages as well. For example, the modern German, sezaryen (literally: "emperor's cut")(21) The Russian term kesarevo secheniye(Кесарево сечение késarevo sečénije) literally means Caesar's section. The Arabic term (Wlaada qaySaríyya) also means "Caesarean birth." In Romaniaand Portugal,(22) it is usually called cesariana, meaning from (or related to) Caesar.

IDEAS WHERE THE RESEARCH GO NEXT-

In the United States, C-section rates have increased from just over 20% in 1996 to 33% in 2011 This increase has not resulted in improved outcomes resulting in the position that C-sections may be done too frequently. (23)

The World Health Organization officially withdrew its previous recommendation of a 15% C-section rate in June 2010. Their official statement read, "There is no empirical evidence for an optimum percentage. What matters most is that all women who need caesarean sections receive them. (24)

Speculation explaining a relationship between birth weight and maternal pelvis size has been proposed. The explanation, based on Darwinian-inspired logic, states that since the advent of successful Caesarean birth more mothers with small pelvises and babies with large birth weights survive. This hypothesis would predict an increased average birth weight, which has been observed. It is unclear what component contributes more to this effect; evolution or environment. (25)

Brazil is one of the countries with the highest Cesarean section rate in the world with rates in the public-sector averages 35–45% while the private sector rate is as high as 80-90% .

SIGNIFICANCE OF RESEARCH

The use of fertility medication that stimulates the ovary to release multiple eggs and of IVF with embryo transfer of multiple embryos has been implicated as an important factor in preterm birth. Maternal medical conditions increase the risk of preterm birth. Often labor has to be induced for medical reasons; such conditions include high blood pressure,(26) pre-eclampsia,(27)maternal diabetes,(28)asthma, thyroid disease, and heart disease.

In a number of women anatomical issues prevent the baby from being carried to term. Some women have a weak or short cervix (the strongest predictor of premature birth) (29) (30)Women with vaginal bleeding during pregnancy are at higher risk for preterm birth. While bleeding in the third trimester may be a sign of placenta previa or placental abruption – conditions that occur frequently preterm – even earlier bleeding that is not caused by these conditions is linked to a higher preterm birth rate,(31)Women with abnormal amounts of amniotic fluid, whether too much (polyhydramnios) or too little (oligohydramnios), are also at risk. The mental status of the women is of significance. Anxiety (32)and depression have been linked to preterm birth.

Finally, the use of tobacco, cocaine, and excessive alcohol during pregnancy increases the chance of preterm delivery. Tobacco is the most commonly abused drug during pregnancy and contributes significantly to low birth weight delivery, (33) Babies with birth defects are at higher risk of being born preterm, (34)

Passive smoking and/or smoking before the pregnancy influence the probability of a preterm birth. The World Health Organization published an international study in March 2014. (35)

Presence of anti-thyroid antibodies is associated with an increased risk preterm birth with an odds ratio of 1.9 and 95% confidence interval of 1.1–3.5. (36)

A 2004 systematic review of 30 studies on the association between intimate partner violence and birth outcomes concluded that preterm birth and other adverse outcomes, including death, are higher among abused pregnant women than among non-abused women. (37)

The Nigerian cultural method of abdominal massage has been shown to result in 19% preterm birth among women in Nigeria, plus many other adverse outcomes for the mother and baby. (38) This ought not be confused with massage conducted by a fully trained and licensed massage therapist or by significant others trained to provide massage during pregnancy, which has been shown to have numerous positive results during pregnancy, including the reduction of preterm birth, less depression, lower cortisol, and reduced anxiety. (39)

DEBATE-

The American college of Obstetrician and Gynecologist advises women to plan for vaginal delivery whenever possible.

In the United States, one in three women have their babies by elective C.S.

Studies have shown that babies born by elective C.S, before 37 wks are more vulnerable to have respiratory, gastrointestinal and metabolic complications at or immediately following delivery.

The following disorders Hyaline membrane disease and Neonatal necrotizing enter ocolitis are well documented and recognized complications beyond dispute with greater degree of morbidity and mortality and which could be averted successfully by preplanning and with modern hi-tecue treatment.

I.ase (HMD)-Respiratory Distress Syndrome.

HMD is basically a disease of premature Infant, accounting for 20% of all deaths in the first 28days of life.

Most affected infants weigh 1000 to 1500gm.

Contributing factors are

1) Cesarean section:Devoid of Hormones like Prolactin and Oxytocin released to its peak concentrations during labor. These augment fetal lung maturation and adequate production of surfactant in full term.
2) Maternal Diabetes:
   Increased blood glucose in diabetic mother causes increased fetal insulin secretion, which inhibits the effects of steroids, which are essential for maturation of lungs and surfactant adequate production.

Two defects have been identified with HMD.

Deficiency of pulmonary surfactant. Normally surfactant is produced by type II pneumocytes.It is a mixture of 10% proteins and 90% phospholipids, in which 75% is phosphotidylcholine(LECITHIN) and 10%phosphotidylglycerol(SPHINGIMYELIN). Lecithin production begins at 5 months of gestation, but secretion begins at 7 months and levels rises sharply at 34 to 36th weeks of gestation. The level of Sphyingomyelin does not change during this time. An L/S ratio of

about 2 indicates fetal maturity, 1.2 indicates a possible risk and below 1 a definite risk. Pulmonary surfactant is released into the amniotic fluid can be sampled by amniocentesis to assess fetal lung maturity. A LECITHIN-to Sphyingomyelin ratio above 2:1 predicts extra uterine survival without respiratory distress syndrome. Sphyingomyelin (Phosphotidyl glycerol) is not present in the lungs before 36th week of pregnancy and before 35th week, immature surfactant contains a higher proportion of Sphyingomyelin, than adult surfactant.

Intra alveolar hypoxia induces pulmonary arterial vasoconstriction, thus increasing R to Left shunt through the duct us- arteriousus, foramen ovule and within the lung itself.

Pulmonary hypoxic ischemia further aggravates alveolar epithelial damage and injures alveolar capillary endothelium causing leakage of protein-rich fluid into alveolar spaces. These conspicuous, eosinophilic, protein-rich amorphous structures together called Hyaline-Membranes, hence the original term Hyaline Membrane Disease.

Clinical features:
Most newborns destined to develop RDS appear normal at birth. The first symptom is respiratory distress occurs within an hour of birth and increases rapidly causing central cyanosis and respiratory failure.

Chest x-ray would show ground glass appearance with fluid filled alveoli and white-out of lungs.

Pathology:
The lungs are dark red, solid and airless alveoli are collapsed. Respiratory bronchioles are dilated and contain cellular debris, protenacious edema fluid.

Treatment:
Therapeutic advances have improved survival in infants with RDS. Corticosteroids (Betamethazone) administered to mother 24 hrs before delivery in two divided doses hastens fetal lung maturation. Use of animal derived surfactants (porcine and Bovine), combined with improved ventillatory therapy has dramatically improved the survival of infants in RDS. Currently even very small premature infants have an 85% to 90% chance of survival. Medical reasons for early delivery include preeclampsia.

Hyaline Membrane Disease
In those at risk, the hormone progesterone, if taken during pregnancy, may prevent preterm birth. (40)Evidence does not support the usefulness of bed rest (41) (45) It is estimated that at least 75% of preterm infants would survive with appropriate treatment, and the survival rate is highest among the infants born the latest (40) In women who might deliver between 24 and 37 weeks corticosteroids improve outcomes. (42) (46)A number of medications including nifedipine may delay delivery so that a mother can be moved to where more medical care is available and the corticosteroids have a greater chance to work. (43)(47)Once the baby is born care includes keeping the baby warm through skin to skin contact, supporting breastfeeding, treating infections, and supporting breathing (40)

Postpartum infection is one of the main causes of maternal death and may account for 10% of maternal deaths globally. (48) (49) (50) Caesarean section greatly increases the risk of infection and associated morbidity (estimated to be between 5 and 20 times as high), and routine use of antibiotic prophylaxis to prevent infections is recommended. (51)Infection can occur in around 8% of women who have caesareans, largely endometritis, urinary tract infections and wound infections. The use of preventative antibiotics in women undergoing cesarean section decreased wound infection, endometritis, and serious infectious complications by about 65%.Side effects and effect on the baby is unclear (52)

Women who have caesareans can recognize the signs of fever that indicate the possibility of wound infection. Taking antibiotics before skin incision rather than after cord clamping reduces the risk for the mother, without increasing adverse effects for the baby. Whether a particular type of skin cleaner improves outcomes is unclear.

Some doctors believe that during a caesarean section, mechanical cervical dilation with a finger or forceps will prevent the obstruction of blood and lochia drainage, and thereby benefit the mother by reducing the risk of death. The available clinical evidence is not sufficient to draw a conclusion on the effect of this practice. (53)

REFERENCES

1. Preterm Labor and Birth: Condition Information". National Institutes of Health. 3 November 2014. Archived from the original on 2 April 2015. Retrieved 7 March 2015.
2. Minnasucs dorff, -New population base study August/24/2015, Pediatrics .official journal of pediatrics. World Health Organization (November 2014). "Preterm birth Fact sheet N°363". who.int. Archivedfrom the original on 7 March 2015. Retrieved 6 March 2015
3. What are the risk factors for preterm labor and birth?". National Institutes of Health. 3 November 2014. Archivedfrom the original on 5 April 2015. Retrieved 7 March 2015.
4. What treatments are used to prevent preterm labor and birth?". National Institutes of Health. 3 November 2014. Archived from the original on 2 April 2015. Retrieved 7 March 2015.
5. Human Reproduction. Vol. 18, No. 9, (Sep 2003), pp 1937-43. Allen, MC. (2008). Neurodevelopmental outcomes of preterm infants. Current Opinion in Neurology. Vol. 21, No. 2, (Apr 2008), pp 123-8. Allen, VM., Wilson, RD., & Cheung, A. (2006) Pregnancy outcomes after assisted reproductive technology.
6. placental disease. Obstetrics and Gynaecology. Vol. 110, No. 1, (Jul 2007), pp. 128-33.
7. Human Reproduction. Vol. 18, No. 11, pp. 2478-2484 Behrman, RE., & Butler, SA. (2007) Preterm birth: Causes, consequences, and prevention. National Academic Press, ISBN, Washington, DC. Bejar, R., Curbelo, V., Davis, C., & Gluck, l. (1981). Premature labour. II. Bacterial sources of phospholipase
8. Journal of Clinical Ultrasound. Vol. 26, No. 1, (1998), pp. 3-6. Cooperstock, M., & Campbell, Excess males in preterm birth: interactions with gestational age, race, and multiple birth.
9. American Journal of Obstetrics and Gynaecology. Vol. 194, No. 2, (Feb 2006), pp. 493-500. Astolfi, P., & Zonta, LA. (1999). Risks of preterm delivery and association with maternal age, birth order and fetal gender. Human Reproduction. Vol. 14, No. 11, (Nov 1999), pp. 2891-2894.
10. The Maternal Oral Therapy to Reduce Obstetric Risk (MOTOR) Investigators. (2009). Effects of Periodontal Therapy on Rate of Preterm Delivery: A randomized controlled trial.
11. Journal of Clinical Ultrasound. Vol. 26, No. 1, (1998), pp. 3-6. Cooperstock, M., & Campbell, Excess males in preterm birth: interactions with gestational age, race, and multiple birth.
12. Segen, J. C. (1992). The Dictionary of Modern Medicine: A Sourcebook of Currently Used Medical Expressions, Jargon and Technical Terms. Taylor & Francis. p. 102. ISBN 1850703213. Retrieved 2012-12-07
13. Caesarean section?: etymology and early history"Archived 15 May 2013 at the Wayback Machine., South African Journal of Obstetrics and Gynaecology, August 2009 by Pieter W.J. van Dongen
14. As there was a cultural taboo against burying an undelivered woman in Roman and German societies, according to Lex Caesarea..." U Högberg, E Iregren, CH Siven, "Maternal deaths in medieval Sweden: an osteological and life table analysis", Journal of Biosocial Science, 1987, 19: 495–503 Cambridge University Press
15. University of Virginia Health System, Claude Moore Sciences Health Library, Ancient Gynecology:Caesarean SectionArchived 3 April 2013 at the Wayback Machine.
16. Bad Medicine: Misconceptions and Misuses Revealed," by Christopher Wanjek, p. 5 (John Wiley & Sons, 2003)
17 could not survive the trauma of a Caesarean" Oxford Classical Dictionary, Third Edition, "Childbirth"
18. Commentary to Mishnah Bekhorot 8:2
19. Caesarean | Caesarian, adj. and n.". OED Online. June 2013. Oxford University Press. 13 June 2013 <http://www.oed.com/view/Entry/26016>.
20. Merriam-Webster (2003), Merriam-Webster's Collegiate Dictionary (11th ed.), Springfield, Massachusetts, USA: Merriam-Webster, ISBN 978-0-87779-809-5
21. For a summary (in German), of an article (also in German) that deals usefully with many of the relevant historical and linguistic questions raised here, go here [1] Archived 6 January 2007 at the Wayback Machine..
22. "Archived copy". Archived from the original on 19 October 2014. Retrieved 19 October 2014.
23. BBC News. 30 June 2010. Archived from the original on 20 July 2010.
24. Walsh, Joseph A. (2008). "Evolution and the Cesarean Section Rate". The American Biology Teacher. 70 (7): 401–404. doi:10.1662/0002-7685(2008)70[401:ETCSR]2.0.CO;2. ISSN 0002-7685.
25. Ramires de Jesus, G; Ramires de Jesus, N; Peixoto-Filho, FM; Lobato, G (April 2015). "Caesarean rates in Brazil: what is involved?". BJOG : an international journal of obstetrics and gynaecology. 122 (5): 606–9. doi:10.1111/1471-0528.13119. PMID 25327984.
26. Goldenberg RL, Iams JD, Mercer BM, Meis PJ, Moawad AH, Copper RL, Das A, Thom E, Johnson F, McNellis D, Miodovnik M, Van Dorsten JP, Caritis SN, Thurnau GR, Bottoms SF (1998). "The preterm prediction study: the value of new vs standard risk factors in predicting early and all spontaneous preterm births. NICHD MFMU Network". American Journal of Public Health. 88 (2): 233–238. doi:10.2105/AJPH.88.2.233. PMC 1508185 . PMID 9491013.
27. Bánhidy F, Acs N, Puhó EH, Czeizel AE (2007). "Pregnancy complications and birth outcomes of pregnant women with urinary tract infections and related drug treatments". Scandinavian Journal of Infectious Diseases. 39 (5): 390–397. doi:10.1080/00365540601087566. PMID 17464860.
28. Rosenberg TJ, Garbers S, Lipkind H, Chiasson MA (2005). "Maternal obesity and diabetes as risk factors for adverse pregnancy outcomes: differences among 4 racial/ethnic groups". American Journal of Public Health. 95 (9): 1545–1551. doi:10.2105/AJPH.2005.065680. PMC 1449396 . PMID 16118366.
29. To MS, Skentou CA, Royston P, Yu CK, Nicolaides KH (2006). "Prediction of patient-specific risk of early preterm delivery using maternal history and sonographic measurement of cervical length: a population-based prospective study". Ultrasound in Obstetrics & Gynecology. 27 (4): 362–367. doi:10.1002/uog.2773. PMID 16565989.
30. Fonseca EB, Celik E, Parra M, Singh M, Nicolaides KH (2007). "Progesterone and the risk of preterm birth among women with a short cervix". New England Journal of Medicine. 357 (5): 462–469. doi:10.1056/NEJMoa067815. PMID 17671254.
31. Romero R (2007). "Prevention of spontaneous preterm birth: the role of sonographic cervical length in identifying patients who may benefit from progesterone treatment". Ultrasound in Obstetrics & Gynecology.Krupa FG, Faltin D, Cecatti JG, Surita FG, Souza JP (2006). "Predictors of preterm birth". International Journal of Gynecology & Obstetrics. 94 (1): 5–11. doi:10.1016/j.ijgo.2006.03.022. PMID 16730012.
32. Dole N, Savitz DA, Hertz-Picciotto I, Siega-Riz AM, McMahon MJ, Buekens P (2003). "Maternal stress and preterm birth". American Journal of Epidemiology. 157 (1): 14–24. doi:10.1093/aje/kwf176. PMID 12505886. Archived from the original on 8 October 2007.
33. Parazzini F, Chatenoud L, Surace M, Tozzi L, Salerio B, Bettoni G, Benzi G (2003). "Moderate Alcohol Drinking and Risk of Preterm Birth". European Journal of Clinical Nutrition. 57 (10): 1345–9. doi:10.1038/sj.ejcn.1601690. PMID 14506499.
34. Dola SM, Gross SJ, Merkatz IR, et al. (2007). "The Contribution of Birth Defects to Preterm Birth and Low Birth Weight". Obstetrics & Gynecology. 110 (2, Part 1): 318–324. doi:10.1097/01.AOG.0000275264.78506.63.

35. The Lancet 28. März 2014: Effect of smoke-free legislation on perinatal and child health: a systematic review and meta-analysis. This study is registered with PROSPERO, number CRD42013003522
36. van den Boogaard E, Vissenberg R, Land JA, van Wely M, van der Post JA, Goddijn M, Bisschop PH (2011). "Significance of (sub)clinical thyroid dysfunction and thyroid autoimmunity before conception and in early pregnancy: A systematic review". Human Reproduction Update. 17 (5): 605–619. doi:10.1093/humupd/dmr024. PMID 21622 978.
37. Boy A, Salihu HM (2004). "Intimate partner violence and birth outcomes: a systematic review". Int J Fertil Womens Med. 49(4): 159–64.
38. Ugboma HA, Akani CI (2004). "Abdominal massage: another cause of maternal mortality". Niger J Med. 13 (3): 259–62. PMID 15532228.
39. Field T, Deeds O, Diego M, Hernandez-Reif M, Gauler A, Sullivan S, Wilson D, Nearing G (2009). "Benefits of combining massage therapy with group interpersonal psychotherapy in prenatally depressed women". J Bodyw Mov Ther. 13 (4): 297–303. doi:10.1016/j.jbmt.2008.10.002.
40. World Health Organization (November 2014). "Preterm birth Fact sheet N°363". who.int. Archivedfrom the original on 7 March 2015. Retrieved 6 March 2015.
41 What treatments can reduce the chances of preterm labor & birth?". National Institutes of Health. 11 June 2013. Archived from the original on 2 April 2015. Retrieved 7 March 2015.
42. GBD 2015 Mortality and Causes of Death, Collaborators. (8 October 2016). "Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980-2015:
43. A systematic analysis for the Global Burden of Disease Study 2015". Lancet. 388 (10053): 1459–1544. doi:10.1016/s0140-6736(16)31012-1. PMC 5388903 . PMID 27733281.
44. Sosa, CG; Althabe, F; Belizán, JM; Bergel, E (30 March 2015). "Bed rest in singleton pregnancies for preventing preterm birth". The Cochrane Database of Systematic Reviews. 3: CD003581. doi:10.1002/14651858.CD003581.pub3. PMID 25821121.
45. Antenatal Corticosteroid Therapy for Fetal Maturation". ACOG. October 2016. Archived from the original on 29 September 2016. Retrieved 27 September 2016.
46. Haram, K; Mortensen, JH; Morrison, JC (3 July 2014). "Tocolysis for acute preterm labor: does anything work". The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians. 28: 1–8. doi:10.3109/14767058.2014.918095. PMID 24990666.
47. American College of Obstetricians and Gynecologists; Society for Maternal-Fetal Medicine (October 2017). "Obstetric Care consensus No. 6: Periviable Birth". Obstetrics and Gynecology. 130 (4): e187–e199. doi:10.1097/ AOG. 00000 00000002 352. ISSN 1873-233X. PMID 28937572.
48. National Collaborating Centre for Women's and Children's Health (UK). "Caesarean Section: NICE Clinical Guidelines, No. 132". National Institute of Health and Clinical Excellence. PMID 23285498. Archived from the original on 2 January 2016.
49. Kassebaum, NJ; Bertozzi-Villa, A; Coggeshall, MS; Shackelford, KA; Steiner, C; et al. (May 2, 2014). "Global, regional, and national levels and causes of maternal mortality during 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013". The Lancet. 384 (9947): 980–1004. doi:10.1016/S0140-6736(14)60696-6. PMC 4255481 . PMID 24797575.
50. Smaill, Fiona M.; Grivell, Rosalie M. (2014-10-28). "Antibiotic prophylaxis versus no prophylaxis for preventing infection after cesarean section". The Cochrane Database of Systematic Reviews (10): CD007482. doi:10.1002/14651858.CD007482.pub3. ISSN 1469-493X. PMID 25350672.
51. Mackeen, A. Dhanya; Packard, Roger E; Ota, Erika; Berghella, Vincenzo; Baxter, Jason K; Mackeen, A. Dhanya (2014). "Timing of intravenous prophylactic antibiotics for preventing postpartum infectious morbidity in women undergoing cesarean delivery". Reviews. doi:10.1002/14651858.CD009516.pub2.
52. Hadiati, DR; Hakimi, M; Nurdiati, DS; Ota, E (Sep 17, 2014). "Skin preparation for preventing infection following caesarean section". The Cochrane Database of Systematic Reviews. 9: CD007462. doi:10.1002/14651858.CD007462.pub3. PMID 25229700.
53. Liabsuetrakul, Tippawan; Peeyananjarassri, Krantarat; Liabsuetrakul, Tippawan (2011). "Mechanical dilatation of the cervix at non-labour caesarean section for reducing postoperative morbidity". Reviews. doi:10.1002/14651858.CD008019.pub2.