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CONGENITAL BIRTH DEFECT: PERSPECTIVE TO THE DAY OF CONCEIVE OF A MENSTRUAL CYCLE

Raj Nitesh kumar[1]
Primary Health Center- Arwal,
Bihar-804401, India

ABSTRACT

The menstrual cycle is the regular natural change that occurs in the system, specifically the uterus and ovaries that makes pregnancy possible. The menstrual cycle consists of the follicular phase, ovulation, and the luteal phase. The median duration of a menstrual cycle is 28 days with most cycle lengths between 25 to 30 days. Ovulation takes place in med of cycle and Fertilization occurs after ovulation in fallopian tube. A sperm alive 4 days after discharged in female reproductive tract and ova survive 2 day after ovulation. So fertilization occurs almost at days 11th to 18th, rest days are called safe period. A disrupted cycle around the time of travelling is usually significant in relation to overall menstrual health. Climatic variations affects on woman menstrual cycles. In nearly 50% of cases the exact cause of congenital anomaly could not be identified, although there are some known risk factors which can be linked with the causation of malformation. Congenital anomalies can be caused by single gene defects, chromosomal disorders, multi-factorial inheritance and environmental factors. In a disrupted menstrual cycle, the day of ovulation varies and delay ovulation may be lead to congenital birth defect.

KEY WORDS: ***Menstrual cycle, Ovulation, Biological clock, Safe-period, Environmental factors, Congenital birth defect.***

INTRODUCTION

This essay is primarily about impact of the concieve's day of a menstrual cycle on congenital birth defect:

Menstrual cycle: The menstrual cycle is the regular natural change that occurs in the system, specifically the uterus and ovaries that makes pregnancy possible. The menstrual cycle can be described by the ovarian or uterine cycle. The ovarian cycle describes changes that occur in the follicles of the ovary whereas the uterine cycle describes changes in the endometrial lining of the uterus. Both cycles can be divided into three phases. The ovarian cycle consists of the follicular phase, ovulation, and the luteal phase, whereas the uterine cycle consists of menstruation, proliferative phase, and secretary phase (C.C Charan chatterjee, 1995). The length of a menstrual cycle is the number of days between the first days of menstrual bleeding of one cycle to the onset of menses of the next cycle. The median duration of a menstrual cycle is 28 days with most cycle lengths between 25 to 30 days. The menstrual cycle may be divided into two phases: (1) follicular or proliferative phase, and (2) the luteal or secretary phase. The follicular phase begins from the first day of menses until ovulation. The development of ovarian follicles characterizes this phase. The LH surge is initiated by a dramatic rise of estradiol produced by the pre-ovulatory follicle and results in subsequent ovulation. The LH surge stimulates luteinization of the granulosa cells and stimulates the synthesis of progesterone responsible for the mid-cycle FSH surge. Also, the LH surge stimulates resumption of meiosis and the completion of reduction division in the oocyte with the release of the first polar body. The luteal phase is 14 days long in most women. If the corpus luteum is not rescued by pregnancy, it will undergo atresia. The resultant progesterone withdrawal results in menses. The average duration of menstrual flow is between four and six days, but the normal range in women can be from as little as two days up to eight days. The average amount of menstrual blood is 30ml, and over 60 ml is considered abnormal (V G Padubidri, Shirish N Daftary, 2004).

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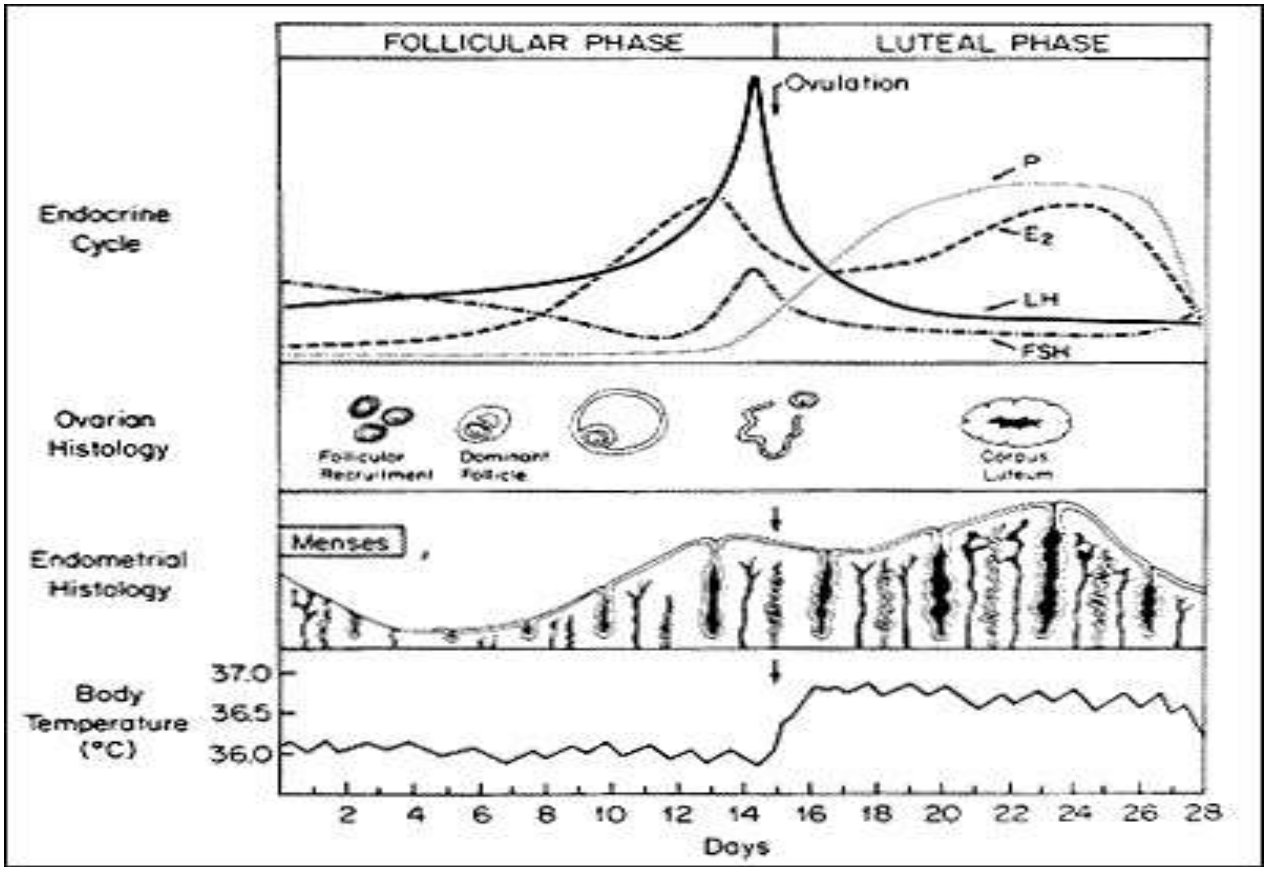

Fig.1: Menstrual cycle

Oogenesis: The formetion and development of ova in female through the meiosis is called oogenesis. Oogenesis is initiated and partially completed in the follicles of the ovary. Unlike spermatogenesis, which begins at puberty, oogenesis begins before birth, although it is not completed until many years later. By the time the foetus is six months old, all the oogonia that female will even produce, are already formed by mitosis. At the time of birth a female has about 5 lacs primary oocytes. Most of them will degenerate before puberty. Only about 500 will develop sufficiently to be relwased by ovulation. As oogenesis continues, a diploid primary oocyte undergoes meiosis I , producing a functional cell called a secondary oocyte and a small non functional cell called a polar body that contain a very little amount of cytoplasm but full set of chromosomes. The polar body degenerate immediately or after going through meiosis ll. The secondary oocyte that is the immature ovum, released from the ovary at ovulation *(Kumar Pushkar, A P Singh,2012).*

Ovulation: An ovam is released from the ovarian follicles into the oviduct. During the follicular phase, estradiol suppresses release of luteinizing hormone (LH) from the anterior pituitary gland. When the egg has nearly matured, levels of estradiol reach a threshold above which this effect is reversed and estrogen stimulates the production of a large amount of LH. This process, known as the LH surge, starts around day 12 of the average cycle and may last 48 hours. The release of LH matures the egg and weakens the wall of the follicle in the ovary, causing the fully developed follicle to release its secondary oocyte. If it is fertilized by a sperm, the secondary oocyte promptly matures into an ootid and then becomes a mature ovum. If it is not fertilized by a sperm, the secondary oocyte will degenerate (Arthur C, Guyton,2004) .

Fertilization: Fertilization occurs after ovulation in fallopian tube. A sperm alive 4 days after discharged in female reproductive tract. So fertilization occurs almost in days 11th to 18th because ovulation occurs at day 14th of cycle and ova survive 2 day after ovulation (Silverthorn DU,2013).Only

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when a secondary oocyte is penetrated by sperm, it will completes meiosis ll and producing a mature ovum whose haploid nucleus combines with the haploid sperm nucleus to produce the first diploid cell of a new individual(Kumar Pushkar, A P Singh,2012).

Effect of travel and environmental variation on menstrual cycle: A disrupted cycle or even a missed period around the time of travelling is usually significant in relation to overall menstrual health. While it is not ideal, it is common, and often occurs when travelling across multiple time zones. Climate changes effects on woman menstrual cycles by **varying the bodies' metabolic rate** which clues again to hormonal inequity. When anybody geographically transfers to a place where the weather is hot or cold the body doesn't regulate automatically. This sudden climate variation may change a woman's menstrual cycle. When adjusting to the physiological imbalances that are causing irregularities in Circadian Rhythm. However, getting enough sleep, eating well-balanced and regular meals, and doing some exercise can all help get body back on schedule. Once biological clock has adjusted to the new environment, menstrual cycle should regular after (Treloar A.E., et al).

Congenital Birth defect: Congenital birth defects can be defined as structural or functional anomalies that occur during intrauterine life and can be identified prenatally, at birth or later in life. Congenital birth defects are also known as congenital disorders or congenital malformations. Congenital birth defects are the major cause of new born deaths within four weeks of birth and can result in long-term disability with a significant impact on individuals, families, societies and health-care systems. In nearly 50% of cases the exact cause of congenital anomaly could not be identified, although there are some known risk factors which can be linked with the causation of malformation. Congenital anomalies can be caused by single gene defects, chromosomal disorders, multifactorial inheritance, environmental teratogens (an agent, which can cause a birth defect) and micronutrient deficiencies (Davidson, 1992).

REVIEW OF LITERATURE

According to World Health Organization, an estimated 270000 deaths during the first 28 days of life were reported due to congenital anomalies globally (WHO, 2010). Delayed ovulation may be a sign of poor egg quality (Amos Grunebaur, 2019). A germ line mutation often arises due to endogenous factors, like errors in cellular replication and oxidative damage (Crow JF, 2000). Congenital cardiovascular malformations present some of the most interesting and difficult challenges in medicine. They are exceptionally common affecting 0.5-0.7 % of all live born infants (Hoffimen and Kaplan, 2002, Hoffmen et al, 2004).

METHODS

Rational for choice of client: It is a case study of a women registered for JSY at sadar P.H.C of arwal district in Bihar. Taken interviwe to JSY benificiary for case study and find a specific history.

This essay will consider the case of married women who delivered first male baby weight 2000gm with some birth defect : Hyopspadias and Congenital Heart problem dilated RA,RV,FO and survived only 28 days with vital supports. But she delivered alive second healthy Male baby weight 3800 gm after 2 year.

HISTORY OF CLIENT

Table.1 : comparison of client's History

	Pre-Gravida	1st Gravida	2nd Gravida
Age	24 years	25 years	26 years
Locality	North India	North India	North India
B.P	118/78 mm of Hg	122/82 mm of Hg	120/80 mm of Hg
Pulse	76/min	78/min	74/min
Weight	55 kg	58 kg	59 kg
Height	153 cm	153 cm	153 cm
Diabetes	NO	NO	NO
Thyroid disease	NO	NO	NO
Alcohol	NO	NO	NO
cigarette	NO	NO	NO

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Working women/House wife	House wife	House wife	House wife
M C	Regular(28days)	Important incidence	Regular(28days)
Family Planning	Safe-period method	-------	-------
Conceive	------	Day 21	Day 14

Important incidence: Anamika kumari and his husband use safe period method for family planning during passed married life. Anamika kumari surprisingly conceive first time when fail in safe period family planning method due to a holiday Tour of puri (Udisha).She conceive at day 21st of period but ovulation take place at day 14th-15th, High level of LH cause rupture of Graafian follicle and release ovum.

First Gravida:

The day of Conceive: 21st day of menstrual cycle.
First trimester: USG Baby growth normal, AFI : Adequate.
Second trimester: USG Baby growth normal, AFI: 7.5 (Normal range 8-18).
Third trimester: USG Baby body weight 1960 gm.
AFI: 6.9 (Normal range 8-18).
Birth: A Male baby delivered weight 2000 gm with some birth defect: HYOPSPADIAS and Congenital Heart defect dilated RA, RV and FO.
Baby survives only 28 days with vital support.

Second Gravida:

The day of Conceive: 14st day of menstrual cycle.
USG Report: Normal at first, second and third trimester.
Birth: Delivered Alive Male healthy baby weight 3800gm.

Consider how Travel and Location change affect the client: Anamika kumari and his husband use safe period method for family planning during passed married life. She has no use of contraceptive at any time in life. His menstrual cycle is almost regular, so use safe period method for family planning. Anamika kumari and his husband once go to puri (udishs) for a holiday. Anamika kumari surprisingly conceive first time when fail in safe period family planning method due to a holiday tour of puri (Udisha).She conceive at the day 21st of period. But ovulation generally takes place at day 14th-15th, High level of LH cause rupture of Graafian follicle and release ovum. A disrupted cycle around the time of travelling is usually significant in relation to overall menstrual health. Climate changes have effects on woman menstrual cycles by varying the bodies' metabolic rate which clues again to hormonal inequity. When anybody geographically transfers to a place where the weather is hot or cold the body doesn't regulate automatically. This sudden climate change may change a woman's menstrual cycle due to change in 'body clock', the circadian rhythm.

DISCUSSION

Unlike spermatogenesis, which begins at puberty, oogenesis begins before birth, although it is not completed until many years later. By the time the foetus is six months old, all the oogonia that female will even produce, are already formed by mitosis. At the time of birth a female has about 5 lacs primary oocytes. Most of them will degenerate before puberty. Only about 500 will develop sufficiently to be released by ovulation. As oogenesis continues, a diploid primary oocyte undergoes meiosis I , producing a functional cell called a secondary oocyte and a small non functional cell called a polar body that contain a very little amount of cytoplasm but full set of chromosomes. A disrupted cycle around the time of travelling is usually significant in relation to overall menstrual health. Climate changes have effects on woman menstrual cycles by varying the bodies' metabolic rate which clues again to hormonal inequity. When anybody geographically transfers to a place where the weather is hot or cold the body doesn't regulate automatically. This sudden climate change may change a woman's menstrual cycle due to change in "biological clock". Fertilization occurs almost at days 11th to 18th because ovulation occurs at day 14th. Only if secondary oocyte is penetrated by sperm, it will complete meiosis ll and producing a mature ovum whose haploid nucleus then combines with the haploid sperm nucleus to produce the first diploid cell of a new individual. In present case fertilization occurs at day 21st, because client use safe period method of family planning and occasionally go to a 5 days tour of puri (udisha). Due to this travel and climatic variation the period *disrupts*, so she conceive at day 21st. That can be cause of congenital birth defect of their first baby.

CONCLUSION

Present case study reveals that travel and climatic variation affects menstrual cycles by varying the metabolic rate. A disrupts menstrual cycle around the time of travel and climatic variation is usually occurs which influence length of cycle and change

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the time of ovulation. Due to delay in ovulation, single gene defect or chromosomal disorders may be occurs in the ova and causes the congenital birth defect.

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