ORIGINAL RESEARCH PAPER
Volume-8 | Issue-10 | October - 2019 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

EFFECTS OF MODERN LIFESTYLE ON KSHETRA : A LITERATURE REVIEW

Ayurveda

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ABSTRACT

Background: According to Ayurveda kshetra means the place where beej implants and from modern point of view fertilized ovum implants itself in the endometrium of the uterus. So we can correlate khsetra with endometrium.
Nowadays changing food habits, lack of exercise, sedentary work, loss of emotional support, competition in every field, incresed stress all these factors of modern lifestyle influences on physical and mental health of human beings.
In women, normal and regular menstrual cycles are indication of good reproductive behaviour and menstrual cycle is influenced by hypothalamo-pituitary-ovarian axis. Incresed stress, incresed BMI index, affects hypothalamo-pituitary-ovarian axis, which inturn disturbes endometrial behaviour.
Materials and Methods: In this paper various textbooks and journals are studied .
Conclusion: We can conclude that modern lifestyle affects endometrium's (kshetra) receptivity which may be responsible for implantation failure.

KEYWORDS

Modern lifestyle, Kshetra, Endometrium, Implantation

INTRODUCTION

According to Sushrutacharya, as in nature, good season, farm, water & seed together gives rise to the sprout. In the same way, in human beings, these very four factors are equally essential for the formation of embryo.[1]

According to Ayurveda Kshetra means the place where beej implants and from modern point of view fertilized ovum implants itself in the endometrium of the uterus. So we can correlate khsetra with endometrium. Endometrium shows changes during menstrual cycle which are very essential for implantation of fetus. Endometrial changes are dependent on ovarian cycle and again this ovarian cycle is dependent on hypothalamo-pituitary-ovarian axis. Stress, increased BMI, disturbes hormonal secretions of hypothalamo-pituitary-ovarian axis which inturn disturbes endometrial behaviour.

MATERIAL & METHODOLOGY

In this paper following textbooks are studied : 1) Sushrut Samhita Part-1, 14th Edition Ambikadatta Shashtri 2) Textbook of Gynaecology, 6th Edition, D. C. Dutta 3) Human Embryology, 11th Edition, Inderbir Singh 4) Shaw's Textbook of Gynaecology, 16th edition, Shaw 5) How modern lifestyle affects our physical and mental health, The Scientific World -https://www.scientificworldinfo.com/2018/1 1/how-modern-lifestyle-affects-our-physical-and-mental-health.html 6) Influence of medical conditions and lifestyle factors on the menstrual cycle, Rowland AS et.al., Epidemiology, ISSN Print: 1044-3983. 7) Menstrual abnormalities and their association with lifestyle pattern in adolescent girls of Garhwal,India, Priyanka Negi et.al., Journal of Family Medicine and Primary Care, 2018 Jul-Aug, Doi: 10.4103/jfmpc.jfmpc_159_17.

REVIEW OF LITERATURE

The purpose of menstrual cycle is to prepare the endometrium for reception of fertilized ovum.[5]The Menstrual cycle consists of ovarian cycle & endometrial cycle. The length of the cycle is usually of 28 days and can vary from 21–40 days. The 1st day of bleeding in the present cycle marks the beginning of the menstrual cycle & ending of the cycle is the 1st day of bleeding of the next cycle. The endometrium is the lining epithelium of the uterine cavity above the level of internal os. It consists of a surface epithelium, glands stroma & blood vessels. The endometrium of the body of the uterus can be divided into two zones: a superficial termed the functional layer and a deeper one termed the basal layer.

Basal Zone: It is about one-third of the total depth of the endometrium and lies in contact with the myometrium. It consists of stromal cells which are compactly placed. The base of the endometrial glands extends into the layer. The zone is supplied by the basal arteries. The zone is uninfluenced by hormone and as such, no cyclic changes are observed. After shedding of the superficial part during menstruation, the regeneration of all the components occurs from this zone. It measures about 1 mm.

Functional Zone: This zone is under the influence of fluctuating cyclic ovarian hormones, estrogen and progesterone. The changes in different components during an ovulatory cycle has been traditionally divided into four stages which are however arbitary, the changes are really continuous.
1. Regenerative phase
2. Proliferative phase
3. Secretory phase
4. Menstruation phase

Regenerative Phase

Regeneration of the endometrium starts even before the menstrual bleeding has stopped and is completed 2–3 days after the end of menstruation. The cubical surface epithelium is derived from the gland lumina and stromal cells. New blood vessels grow from the stumps of the old one. The glands and the stromal cells are regenerated from the remnants left in the basal zone. The stromal ground substance re-expands. The thickness averages 2 mm.

The Proliferative Phase

This stage extends from 5th or 6th day to 14th day (till ovulation). There is proliferation of all the elements—at first slowly but later on at a rapid pace. The glands become tubular and lie perpendicular to the surface & their epithelium becomes columnar with the nuclei placed at the base. The epithelium of one gland becomes continuous with the neighboring gland. Mitosis is evident in the epithelial cells. The stromal cells become spindle shaped with evidences of mitosis and are compact. The spiral vessels extend unbranched to a region below the epithelium where they form loose capillary network. The thickness measures about 3–4 mm.

The Secretory Phase

It begins on day 15 and ceases 5–6 days prior to menstruation. The surface epithelium becomes more columnar and ciliated at places. The glands show predominant changes. The glands increase in size. The lining epithelium become taller. There is appearance of vacuoles due to secretion of glycogen between the nuclei and the basement membrane. The intracellular secretion then enters the gland lumina on the way to the uterine cavity pushing the nuclei back towards the basement membrane. The fluid has got nutritive value for any fertilized ovum reaching the uterus during that time. The blood vessels undergo marked spiraling. The stromal cells become swollen, large and polyhedral and after the 21st day tend to collect more superficially

around the neck of the glands. The deeper spongy layer is composed of convoluted glands, coiled arterioles and comparatively few stromal cells in edematous stroma.[2] The thickness of the endometrium reaches its highest 8-10mm.[4]

The endometrial growth ceases 5–6 days prior to menstruation (22nd or 23rd day of cycle) in an infertile cycle. This is due to dehydration of the glands. The subepithelial capillaries and the spiral vessels are engorged. The regressive changes in the endometrium are pronounced 24–48 hours prior to menstruation.

Menstruation Phase

In the absence of pregnancy, however the superficial parts of the thickened endometrium are shed off and this is accompanied by menstrual bleeding. Menstrual bleeding causes the endometrium to be shed off bit by bit and the blood along with shreds of endometrium flows out through the vagina. The duration of blood flow is 3–6 days. At the end of menstruation the endometrium that remains is only 0.5 mm thick. It consists of the stratum basale along with the basal portions of the uterine glands.[2]

Hypothalamo-Pituitary-Ovarian - Uterine axis

Menstrual cycles are under the control of various hormones.The hypothalamus acts as a major center for the control of reproduction. It secretes the gonadotropin-releasing hormones (GnRH) which in turn controls the secretion of gonadotrophic hormones (FSH & LH) from the pituitary gland.

In the first half of the menstrual cycle the GnRH acts on the anterior pituitary to release FSH. The FSH acts on the ovary and stimulates the formation and maturation of ovarian follicles.

The maturing ovarian follicles now start secreting estrogens. The repair and proliferation of endometrium takes place under the influence of estrogens.

The level of estrogen rises to a peak about 2 days before ovulation. This leads to sudden LH surge about 24–36 hours before ovulation. The LH surge leads to ovulation and the Graafian follicle is transformed to the corpus luteum.

The LH stimulates the secretion of progesterone by the corpus luteum. Though the secretion of progesterone predominates some estrogen is also produced. The combined action of estrogen and progesterone is responsible for secretory phase changes in the endometrium.

If fertilization does not occur, the granulosa cells produce the protein inhibin which acts on the anterior pituitary and inhibits the secretion of gonadotropins. This leads to regression of the corpus luteum.

Due to the regression of the corpus luteum there is a fall in the blood level of estrogen and progesterone. The withdrawal of these hormones causes the endometrium to regress and triggers the onset of menstruation.

If fertilization occurs, the corpus luteum does not regress. It continues to secrete progesterone and estrogen. The secretory phase of endometrium continues and menstruation does not occur.[3]

Effects of Modern Lifestyle

Obesity

Causes

1. Lifestyle change: Better social and economic environment has changed the lifestyle of people. Overeating and overindulgence in wrong foods (fatty food) has led to obesity.
2. Lack of exercise due to heavy and prolonged hours at work causing less utilization of calories and accumulation of body fat.
3. Sedentary lifestyle.

Complications

Menstrual dysfunction due to hormonal and metabolic dysfunction.[4]

Stress

Technology may have an oversized impact on users physical and mental health. Being too connected on social network will cause psychological problems like the distraction, expectation of instant gratification, narcissism, and even depression.

Misuse of technology - Using a Smartphone, computer, and other devices up to midnight, could impact on the pattern of sleep and it may cause sleep disturbance. Addiction to use mobile phone or internet may lead to depression symptoms.[5]

Effects of stress

Emotional upsets are known to stimulate or depress the H–P–O axis and disturb the menstrual cycles.[4]

Previous work done

1. Influence of medical conditions and lifestyle factors on the menstrual cycle, Rowland AS et.al.,Epidemiology, ISSN Print: 1044-398.

This study reveals that

- Long and irregular cycles were more common with menarche after age 14, with depression, and with increasing body mass index.
- Smoking was associated with short cycles.

2. Menstrual abnormalities and their association with lifestyle pattern in adolescent girls of Garhwal,India, Priyanka Negi et.al., Journal of Family Medicine and Primary Care, 2018 Jul-Aug, Doi: 10.4103/jfmpc.jfmpc_159_17**.**

This study reveals that changing lifestyle patterns such as eating junk food and reducing physical activities are directly affecting the menstrual cycle of females.

DISCUSSION

The changes in secretory phase of endometrial cycle are an obvious preparation for providing a suitable environment for implantation of the fertilized ovum when it reaches the uterus.The changes in secretory phase are due to the combined effects of estrogen and progesterone liberated from the corpus luteum after ovulation. The endometrium of secretory phase contains receptors for progesterone which are induced by estrogen in proliferative phase. Thus the progesterone can only act on the endometrium previously primed by estrogen.

Thus endometrial changes essential for implantation are induced by estrogen & progesterone secreted by ovary. Secretion of ovarian hormones are dependent on gonadotropines secreted by pituitary gland & pituitary gland secretions are dependent on hypothalamus. Incressed BMI because of wrong food habits, lack of exercise, sedantary lifestyle causes hormonal imbalance.

Misuse of technology produces psycological problems, sleep disturbances, emotional upsets which stimulate or depress the H–P–O axis.

Hormonal imbalance affects menstrual cycle which causes disturbed endometrial behaviour which in turn is responsible for implantation failure.

CONCLUSION

We can conclude that modern lifestyle affects endometrium's (kshetra) receptivity which may be responsible for implantation failure.

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