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Quantum Biological Device

Eliminating Menstrual Problems

Highlights

Obstetric Care Performance

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Introduction to Ellynizer – An Advanced Quantum Biological Device for Eliminating Menstrual Problems

By Abhijit Naskar

Inventor, Independent Research Scientist, India

Abstract- Since the beginning of life on planet earth, among males and females only the females are endowed with the gift of producing new life. But for this huge privilege a woman has to pay the price almost half of her life, puberty to menopause by going through Menstrual Cycle. Menstruation is a natural phenomenon indicating a woman's fertility. Having regular menstrual cycles is a sign that important parts of the female body are working normally. It also prepares the body for pregnancy each month. A cycle is counted from the first day of the first period to the first day of the next period. But problem with Menstruation begins when abnormality in the regular cycle occurs. The normal range of age for the onset of periods is 9–17 years. Most girls begin puberty at around 10 years of age with an initial phase of accelerated growth and breast development known as breast budding. Shortly after, pubic hair appears, and by 12 years more than 50 per cent of young girls have underarm hair.

Keywords: *menstruation, menstrual cycle, ellynizer, quantum entrainment, quantum biology, hypothalamic-pituitary-ovarian axis, menstrual problems, ovulation, spotting, advanced quantum biological device.*

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Introduction to Ellynizer – An Advanced Quantum Biological Device for Eliminating Menstrual Problems

Abhijit Naskar

Abstract- Since the beginning of life on planet earth, among males and females only the females are endowed with the gift of producing new life. But for this huge privilege a woman has to pay the price almost half of her life, puberty to menopause by going through Menstrual Cycle. Menstruation is a natural phenomenon indicating a woman's fertility. Having regular menstrual cycles is a sign that important parts of the female body are working normally. It also prepares the body for pregnancy each month. A cycle is counted from the first day of the first period to the first day of the next period. But problem with Menstruation begins when abnormality in the regular cycle occurs. The normal range of age for the onset of periods is 9–17 years. Most girls begin puberty at around 10 years of age with an initial phase of accelerated growth and breast development known as breast budding. Shortly after, pubic hair appears, and by 12 years more than 50 per cent of young girls have underarm hair. By the age of 12 years, 50 per cent have menstruated. The peak growth spurt in girls occurs about a year before menstruation begins. Most young women do not settle down to regular ovulatory cycles until two to three years after starting their periods. The first day of each cycle is designated as the first day of menstruation. Ovulation (release of a mature egg) usually occurs on the 14th day of a 28 day cycle, however normal cycles vary in length from 21 to 35 days. Shorter or longer cycles are considered abnormal. Ovulation only occurs when the Hypothalamus, the pituitary gland and the ovaries are in balance, which is called the Hypothalamic-Pituitary-Ovarian Axis. Physical or emotional stress can disrupt the balance, with some women being more vulnerable than others. Examples of physical stress include regular strenuous exercise or weight loss. Normal bleeding occurs for one to seven days. During this time a total of less than 80ml (four tablespoons) of blood is lost. Losses greater than this are considered abnormal as are the passing of clots during menstruation. Some women have very light transient blood loss, commonly known as 'spotting' just after ovulation. This appears to be related to the drop in estrogen immediately following ovulation. Heavier bleeding between periods is not uncommon, but is considered abnormal. When the hypothalamus, pituitary gland and ovaries fall out of balance, all the abnormalities and problems occur in the menstrual cycle. This balance or harmony of the glands can be reinstated artificially with the use of Quantum Entrainment through an Advanced Quantum Biological Device that's being developed by me, called "Ellynizer". Once the balance is reinstated in the neural network of the menstrual cycle all the abnormalities and problems would naturally disappear. In this paper I'm going to elaborate the process of reinstating

balance in the Hypothalamic-Pituitary-Ovarian Axis by stabilizing the menstrual cycle through Quantum Entrainment with the use of Ellynizer.

Keywords: menstruation, menstrual cycle, ellynizer, quantum entrainment, quantum biology, hypothalamic-pituitary-ovarian axis, menstrual problems, ovulation, spotting, advanced quantum biological device.

I. INTRODUCTION

A healthy menstruation of a healthy woman involves the complex interaction of the hypothalamus, pituitary, ovaries, uterus, prostaglandins, and neuroendocrine factors. The ovarian hormones stimulate the target organs of the reproductive tract and exert feedback effects on the CNS-hypothalamic-pituitary unit to influence its hormone secretion. Disruptions can occur at any step in this multi-faceted process, resulting in hormonal imbalance and menstrual irregularities such as dysmenorrhea (painful periods), Pre-Menstrual Syndrome, and impaired fertility. In order to understand the process of Quantum Entrainment on dysmenorrhea, PMS and dysfunctional uterine bleeding, and their potential etiologic factors, it is important to understand the menstrual cycle.

II. MENSTRUAL CYCLE

The median menstrual cycle length is $28 + 3$ days and the average duration of menstrual flow is $5 + 2$ days. The cycle, which can be divided into a follicular phase and a luteal phase, results from complex interactions between the hypothalamus, pituitary, and ovary.

This cyclical process, which requires clear communication between the participating glands, is regulated in part by complex changes in the concentrations of five hormones: gonadotropin-releasing hormone (GnRH), follicle-stimulating hormone (FSH), luteinizing hormone (LH), estradiol (E), and progesterone (P) (Figure1). The interplay of these hormones is extremely complicated, with the steroid hormones (E, P) exerting both negative and positive feedback effects on gonadotropin secretion (LH, FSH). The release of LH and FSH from the pituitary is dependent on the secretion of GnRH from the hypothalamus, which is modulated by the feedback effects of E and P. LH and FSH, in turn, are important in

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stimulating secretion of E and P. Virtually all hormones are released in short bursts or pulses at intervals of 1 to 3 hours, so constant levels are not observed in the circulation. The frequency and amplitude of the pulses are modulated by steroid hormones and vary throughout the cycle. But when these are not modulated properly due to various causes like physical/mental stress, contraceptive pills etc. it results in the ultimate

irregularities and complications of the menses. In this case of unsynchronized modulation of hormones, Advanced Quantum Biological Device – Ellynizer can artificially entrain healthy normal modulation in the frequency and amplitude of the hormonal releases. There are four distinct phases characterized by histological changes that take place in the uterine endometrium and the hormonal release.

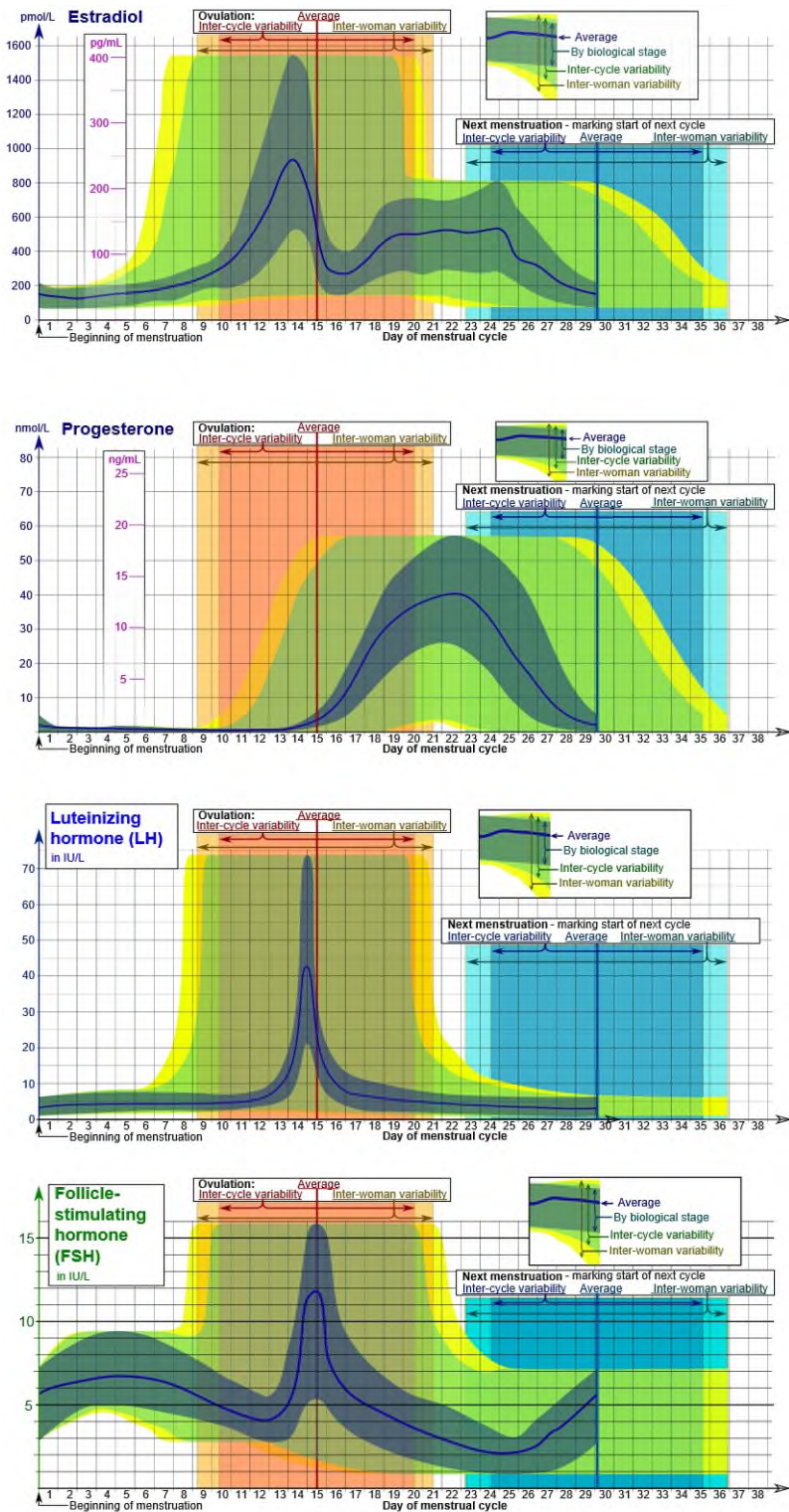


Figure 1

The proliferative phase, also referred to as the estrogen phase, begins approximately 5 days after menstruation and lasts for about 11 days. E secreted by the ovary stimulates the growth of the endometrium. The stroma cells and epithelial cells begin to proliferate rapidly, uterine glands begin to grow and elongate, and the spiral arteries begin to grow in order to supply the thickened endometrium. Rising E levels then trigger the midcycle LH surge, which induces ovulation. When ovulation occurs, the endometrium is approximately 3-4 mm thick. At this time the endometrial glands secrete a thin, stringy mucus, which protects and leads the sperm into the uterus.

The luteal or secretory phase, also called the progesterone phase, occurs after ovulation and lasts for about 12 days. The corpus luteum secretes high quantities of P and some E. The E causes slight cellular proliferation in the endometrium. P causes significant swelling of the endometrium and converts it to an actively secreting tissue. P also inhibits myometrial (uterine smooth muscle) contractions, in large part by opposing the stimulatory actions of E and prostaglandins. The endometrium reaches a thickness of 5-6 mm about one week after ovulation. The purpose of this process is to prepare the uterus for implantation of the ovum if fertilization occurs.

In the premenstruation or ischemic phase, if pregnancy has not occurred, the coiled arteries constrict and the endometrium becomes anemic and shrinks a day or two before menstruation. The corpus luteum of the ovary begins involution. This lasts about 2 days and is terminated by the opening up of constricted arteries, the breaking off of small patches of endometrium, and the beginning of menstruation with the flow of menstrual fluid.

The desquamation of the endometrium, or menstruation, is caused by the sudden fall in blood P and E, which results from regression of the corpus luteum. This deprives the highly developed endometrial lining of its hormonal support. The immediate result is profound constriction of the uterine blood vessels, which leads to diminished supply of oxygen and nutrients. After the initial period of vascular constriction, the endometrial arterioles dilate, resulting in hemorrhage through the weakened capillary walls. The menstrual flow consists of this blood mixed with the functional layer of the endometrium. Prostaglandins are thought to mediate both the initial vasoconstriction as well as the uterine contractions accompanying menstrual flow.

III. MENSTRUATION PROBLEMS

The Menstrual Cycle has been the subject of many traditional tales, myths and mysteries. The hormonal changes during the cycle affect women physically, psychologically and behaviorally. The major problems that women suffer are Dysmenorrhea and Dysfunctional Uterine Bleeding.

a) Dysmenorrhea

Dysmenorrhea, or painful menstruation, is one of the most common gynecological complaints. It is estimated to affect almost half of all women at some time during their childbearing years, usually appearing during adolescence and tending to decrease with age and following pregnancy. Lower abdominal cramping and pain that may radiate to the thighs and lower back is the most prevalent symptom. Headache, nausea, constipation or diarrhea, and urinary frequency are often present, and vomiting may also occur. It is characterized by pain occurring on the first day of menses, usually coinciding with the onset of flow, but may not be present until the second day. The symptoms tend to peak after 24 hours and usually subside after 2 days. While many women suffer mild discomfort during menstruation, dysmenorrhea is present if pain prevents normal activity and requires over-the-counter or prescription medication.

There are three types of dysmenorrhea: primary, secondary, and membranous. Primary dysmenorrhea is characterized by the absence of an organic etiology, while secondary dysmenorrhea is associated with specific diseases or disorders, such as endometriosis, ovarian cysts, pelvic inflammatory disease, adenomyosis, cervical stenosis, fibroid polyps, and possibly uterine displacement with fixation. Membranous dysmenorrhea (uterine cast) is rare and causes intense cramping pain as a result of the passage of the intact endometrial cast through an undilated cervix. The most common misdiagnosis of primary dysmenorrhea is secondary dysmenorrhea due to endometriosis. With endometriosis, the pain increases 1 to 2 weeks before the menses, reaches a peak 1 to 2 days before, and is relieved at the onset of flow or shortly thereafter. The use of intrauterine devices (IUDs) may also cause severe cramping. A majority of women suffering from dysmenorrhea are diagnosed with primary dysmenorrhea.

b) The Role of Prostaglandins in the Etiology of Primary Dysmenorrhea

Prostaglandins (PGs) are hormone-like compounds that function as mediators of a variety of physiological responses such as inflammation, muscle contraction, vascular dilation, and platelet aggregation. They are modified forms of unsaturated fatty acids that are synthesized in virtually all cells of the body. Studies have demonstrated that varying PG levels in the female reproductive tract affect the cyclic regression of the corpus luteum and the shedding of the endometrium. PGs may also mediate the effect of LH on ovulation.

The association between the symptoms of dysmenorrhea and intrauterine production of PGs goes back 40 years to the report of Pickles, who first identified a substance in menstrual fluid which stimulated contractions of human uterine smooth-muscle strips. This menstrual stimulant was subsequently found to

contain PGF2 α and PGE2, with the PGF/PGE ratio higher in the endometrium and menstrual fluid of women with primary dysmenorrhea. PGF2 α and PGE2 have opposing vascular effects causing vasoconstriction and vasodilation, respectively. While PGF2 α administration stimulates uterine contractility during all phases of the menstrual cycle, PGE2 may inhibit myometrial contractility during menstruation and stimulate it during the proliferative and luteal phases. Since they are both formed from a common precursor, arachidonic acid, the increase in PGF2 α /PGE2 ratio indicates that synthesis can be directed preferentially towards the PGF compounds. Several studies suggest that women with primary dysmenorrhea have elevated concentrations of PGF2 α and/or its metabolites in the endometrium, menstrual fluid, and peripheral circulation.

These findings have led to the hypothesis that painful menstruation may be due to hypertonicity of the myometrium with accompanying uterine ischemia caused by the local release of excessive amounts of PGs. Furthermore, escape of PGs from the uterus into the systemic circulation could be responsible for other symptoms of dysmenorrhea such as GI disturbances, faintness, dizziness, and headaches. This theory is supported by several research findings: 1) higher PG levels (especially PGF2 α) during the secretory phase than in the proliferative phase of the menstrual cycle; 2) high PG levels and high PGF2 α /PGE2 ratio found in the endometrium and menstrual fluid of women with dysmenorrhea; 3) administration of PGs produces symptoms similar to dysmenorrhea; and 4) PG inhibitors successfully relieve symptoms of dysmenorrhea.

PG synthetase inhibitors (non-steroidal anti-inflammatory drugs), such as ibuprofen, mefenamic acid, naproxen, and indomethacin, have been used as analgesic treatment for dysmenorrhea since the early 1970s. Prior to their discovery, women who had dysmenorrhea were dependent largely on narcotics or oral contraceptives for pain relief. PG inhibitors block PG synthesis early in the inflammatory reaction by inhibiting the cyclooxygenase pathway. Once pain has become severe, relief is unlikely. However, these drugs should not be used prior to the onset of menses because of their teratogenic potential.

In a comprehensive review of clinical trials of PG inhibitors in the treatment of primary dysmenorrhea, it was found that significant pain relief was reported for each of the PG inhibitors for the majority of women. However, the authors concluded that 9% to 22% of dysmenorrheic women will not benefit from PG inhibitor treatment, possibly because some of these women may have secondary dysmenorrhea. While PG inhibitors are generally recognized as effective against pain, there are drawbacks. These drugs are not selective in their inhibition of PGs, translating to a reduction of all PGs, good or bad. In addition, possible side effects include

dizziness, headache, nausea, vomiting, heartburn, and diarrhea, as well as GI damage with protracted use.

Cyclic administration of oral contraceptives, usually in the lowest dosage but occasionally with increased estrogen, is also used to alleviate pain. The mechanism of pain relief may be related to absence of ovulation or to altered endometrium resulting in decreased prostaglandin production during the luteal phase. Surgery is a rare form of intervention used in women who do not respond to medication.

c) *Dysfunctional Uterine Bleeding*

Abnormal uterine bleeding includes excessive bleeding, irregular bleeding, and absence of bleeding. In about 25% of patients, these menstrual irregularities are due to organic causes. Possible organic causes of abnormal uterine bleeding include, but are not limited to: endometriosis, polycystic ovary syndrome, blood dyscrasias, thyroid dysfunction, pelvic inflammatory disease, anorexia nervosa, diabetes mellitus, pituitary disorders, uterine fibroids, cervical stenosis, cervicitis, endometrial polyps, gynecologic carcinoma, syphilis, vaginal adenosis, adrenal disorders, and corpus luteum cysts. The use of oral contraceptives (as well as their discontinuance), anticoagulants, corticosteroids, and IUDs can also cause abnormal uterine bleeding. For the remainder of patients, there is absolutely no organic pathologic condition but rather a functional abnormality in the hypothalamic-pituitary-ovarian axis, defined as dysfunctional uterine bleeding (DUB). Before reaching a diagnosis of true DUB, the clinician must rule out any underlying pathologic conditions. Patterns of abnormal uterine bleeding and possible underlying medical causes are described below:

Menorrhagia is heavy or prolonged menstrual bleeding that may occur as a single episode or on a chronic basis. Normal menstrual flow lasts about 5 days and produces a total blood loss of 60 to 250 ml. In menorrhagia, the menstrual period is extended and total blood loss can range from 80 ml to overt hemorrhage.

Hypomenorrhea is unusually light menstrual flow, sometimes only "spotting."

Metrorrhagia is uterine bleeding that occurs irregularly between menstrual periods. The bleeding is usually light, although it can range from staining to hemorrhage.

Polymenorrhea describes menstruation that occurs too frequently.

Oligomenorrhea is abnormally infrequent menstrual bleeding characterized by 3 to 6 menstrual cycles per year. When menstrual bleeding does occur, it can be profuse and prolonged or decreased in amount.

Amenorrhea (secondary) is the absence of a menstrual period for 3 or more months in women with past menses, precluding normal physiological causes such as pregnancy, lactation, and menopause.

d) *Etiology of Dysfunctional Uterine Bleeding*

Dysfunctional uterine bleeding occurs most commonly at the extremes of reproductive age, with 20% of cases in adolescence and greater than 50% in patients over age 40. Normal endometrial bleeding occurs as a result of stimulation of the endometrium by the physiologic levels and balance of estrogen and progesterone present in the normal ovulatory cycle and by the subsequent rapid withdrawal of these two hormones. This withdrawal results in complete and rapid shedding of the entire functional layer of the endometrium. Various disturbances in this balanced estrogen-progesterone relationship can result in four clinical etiologies of true DUB:

e) *Nonovulatory DUB*

Greater than 70% of DUB cases are associated with anovulation. The bleeding in anovulatory women is generally the result of continued stimulation of the endometrium with unopposed estrogen, which occurs when there is a dysfunction of the hypothalamic-pituitary-ovarian axis. The endometrium, thickened by the estrogen, then sloughs incompletely and irregularly, and bleeding becomes irregular, prolonged, and/or profuse. The absence of progesterone results in deficient endometrial prostaglandins so that appropriate spasm of the coiled arterioles is lacking. This also results in irregular and incomplete shedding of the endometrium.

f) *Irregular Ripening of the Endometrium (Luteal Phase Defect)*

This occurs in ovulatory cycles where the corpus luteum production of progesterone is inadequate to permit development of a receptive endometrium. Any disturbance of follicular growth and development can produce an inadequate follicle and a deficient corpus luteum. Patients with luteal phase defects can present primarily with DUB manifested as premenstrual bleeding, menorrhagia, or polymenorrhea.

Irregular (or Prolonged) Shedding of the Endometrium – Irregular shedding of the endometrium is apparently due to slow degeneration of the corpus luteum with prolonged exposure of the menstruating endometrium to the waning progesterone. Clinically, irregular shedding of the endometrium manifests itself by cyclic prolonged menstruation, which may be profuse.

g) *Endometrial Atrophy (or Threshold Bleeding)*

The normal amount of estrogen secreted during the proliferative phase of the cycle results in a stable endometrium that is intact and does not bleed. In the absence of estrogen, or with the minimal levels present premenarchally or postmenopausally, the endometrium is so unstimulated and atrophic that no bleeding occurs. However, with persistent intermediate levels of estrogen, irregular bleeding occurs. This is because there is

enough estrogen to stimulate the endometrium but not enough to stabilize it, keep it intact, and maintain it.

IV. ANATOMY OF MENSTRUAL CYCLE AND THE PATHWAY OF SOLVING THE MENSTRUAL PROBLEMS

The initial signals for a menstrual cycle are initiated from the very central nervous system (CNS) that also controls all the biological functions of the body. The two major sites of action within the CNS, which are important in the regulation of reproductive function are the Hypothalamus and Pituitary.

The hypothalamus consists of only 0.3 % of the total brain, measures 4 cm³, and weighs approximately 10 g. Despite its small size, it contains many nuclei that are responsible for endocrine regulation, reproduction, metabolism, temperature regulation, emotional responses, and electrolyte balance. The hypothalamus lays beneath the thalamus, hence, the nomenclature. Laterally, it is bordered by the anterior part of the subthalamus, the internal capsule, and the optic tract. The hypothalamus forms the lateral wall and floor of the third ventricle. The median eminence of the hypothalamus extends to the anterior pituitary and contains neurosecretory neurons that affect hormone production from the anterior pituitary. The hypothalamus is comprised of three zones: lateral, medial, and periventricular. Within each zone lie several nuclei, where the arcuate nucleus is pertinent to reproduction. The arcuate nucleus is responsible for the production of GnRH. GnRH is secreted into the portal pituitary circulation, reaching the anterior pituitary to affect FSH and LH release from the anterior pituitary. The hypothalamus also influences thyroid function via TRH (corticotropin -releasing hormone), adrenal function via CRH (corticotropin-releasing hormone), and growth and metabolic homeostasis via GHRH (growth hormone-releasing hormone).

The pituitary gland is a pea-sized gland, also known as the master endocrine gland. It measures 12 × 8 mm and weight approximately 500 mg. It is located beneath the third ventricle and above the sphenoidal sinus in a bony cavity called the sella turcica. The adult pituitary gland contains two major parts: the adenohypophysis and the neurohypophysis. The neurohypophysis is a diencephalic down growth connected with the hypothalamus, while the adenohypophysis is an ectodermal derivative of the stomatodeum. The pituitary gland can also be divided into two major lobes: anterior and posterior. The anterior lobe is equivalent to the adenohypophysis, while the posterior lobe is equivalent to the neurohypophysis. The difference is that the nomenclature of anterior and posterior lobes does not include the infundibulum, which extends from the hypothalamus to the pituitary gland, which contains neural hypophysial connections and is

continuous with the median eminence. The anterior pituitary contains several cell types: gonadotropes (responsible for secretion of FSH and LH), thyrotropes (responsible for the secretion of thyroid-stimulating hormone [TSH]), adrenocorticotropes (responsible for the secretion of ACTH), somatomammotropes (responsible for the secretion of GH), and lactotropes (responsible for the secretion of prolactin). In addition to these hormones, the anterior pituitary secretes activin, inhibin, and follistatin, which play a role in menstrual cycle regulation. The posterior pituitary lobe contains two cell types that secrete ADH (antidiuretic hormone) and oxytocin. The communication between the hypothalamus and the anterior pituitary is vascular; however, it is a neuronal connection between the hypothalamus and the posterior pituitary.

The gonads in the female consist of the bilateral ovaries. The ovaries are located in the pelvis along the sides of the uterus. In reproductive-age women, ovaries measure approximately $2.5 \times 3 \times 1.5$ cm in size. Laterally, the ovary is attached to the pelvic sidewall by the infundibulopelvic ligament, which contains the vascular supply to the ovary (ovarian artery and vein). The ovary consists of an outer cortex and an inner medulla. The ovarian follicles are found in the cortex, while the medulla mainly contains fibromuscular tissue and vasculature. Each ovarian follicle consists of an oocyte surrounded by layers of granulosa and theca cells. These layers will vary depending on the maturation stage of the oocyte contained within the follicle. Within the ovarian cortex, follicles can be found in different stages of development. Earlier stages of follicular development are independent of central nervous system hormone production, while later stages of follicular development will depend on reproductive hormones produced by the central nervous system. The growing ovarian follicle will produce estradiol from the granulosa cells. After ovulation, the remnant cells of the follicle luteinize and start secreting progesterone. The granulosa cells are also responsible for the secretion of inhibin as well as anti-Müllerian hormone (AMH). The uterus is largely a receptive organ to all the steroid hormones that emanate from the endocrine glands. The uterus is a fibromuscular organ that is bordered anteriorly by the urinary bladder and posteriorly by the rectum. The uterus can be divided into two major portions: an upper body (corpus) and a lower cervix. The hollow portion of the uterus contains a mucosal lining called the endometrium. The endometrium contains several layers of cells: the basal layer and the superficial layer. The basal layer is responsible for the regeneration of the endometrial cells. The superficial layers undergo the cyclic changes of the menstrual cycle. The endometrium normally proliferates in response to the rising estradiol levels in the first half of the menstrual cycle and is converted to a secretory layer in response to progesterone produced by the corpus

luteum in the second half of the menstrual cycle. If the cycle does not result in a pregnancy, where there is lack of hCG, progesterone production is not maintained by the corpus luteum, and the endometrium becomes unstable and sloughs in preparation for a new cycle and another attempt for pregnancy. Just outside the uterus, above the skin of the pelvis, is the region for Ellynizer to entrain Quantum Entanglement with the Hypothalamic-Pituitary-Ovarian Axis.

The intricate and beautiful interconnection between the hypothalamus, pituitary, uterus and the ovaries gives a fantastic advantage in entraining harmonizing impulses in the Hypothalamic-Pituitary-Ovarian Axis. Quantum Entrainment over the HPO Axis would reinstate harmony in the menstruation by balancing the proper production of gonadotropin-releasing hormone (GnRH), follicle-stimulating hormone (FSH), luteinizing hormone (LH), estradiol (E), and progesterone (P). Disruption or imbalance in the production of these five hormones leads to most of the unexpected menstrual problems. With this phenomenon the specifically designed harmonizing mild impulses, called the Elly Pulses induces balanced regulation in the menstrual cycle. For the entrainment Elly Pulses utilizes the feedback mechanism of the HPO Axis. The design of Elly Pulses cannot be disclosed due to patent concern. The feedback mechanism of the HPO Axis will entrain the Elly Pulses to the entire system in order to harmonize the menses. Once the Elly Pulses are entrained with the HPO Axis, the specific fusion of resonating wave forms induces the same harmonizing resonance to the entire network of HPO Axis, hence the halted neural pathways and the stressed pathways get relieved of odd overwhelming neural firings along with neural disruptions. Therefore neural signals for the modulated bursts of those five basic and most crucial hormones achieve proper modulation. Elly Pulses are a fusion of different forms of impulses that will go through the pelvis to the Uterine region of the female body, thereafter entrain throughout the entire Hypothalamic-Pituitary-Ovarian Axis. Once entrained, it'll eliminate the hormonal imbalances within the body that cause the most menstrual problems like Dysmenorrhea, DUB etc. Also, the terrible mood swings in Pre-Menstrual Syndrome are the result of complex imbalance in the level of hormones. So, Ellynizer fixes the mood swings as well. The neural network of the HPO Axis acts as a pathway of Quantum Entrainment for the Ellynizer. Past cases of Ellynizer's predecessor "Miracurall" had proven the promising impact of Quantum Entrainment to resolve and cure diseases and complications like Diabetes Mellitus and Tinnitus. In the line of Advanced Quantum Biological Devices right after Miracurall - Ellynizer and Raksanizer will be the solutions to some of the mankind's most aboriginal and day-to-day complications like Menstrual Problems and Neurological Disorders.

V. SUMMARY

Advanced Quantum Biological Devices (AQBD) are the future of mankind's health issues. Without health life is colorless, so no comprise can be made with the health of mankind. Quantum Entrainment has opened a gateway to the future where no health issue will remain unresolved. Neural network of the human body is the most intricate web that handles literally all activities of the human biology. But sometimes due to different causes, the recovery system of this network gets halted, hence it gives birth to varieties of health issues. Quantum Entrainment reinstates the recovery mechanism of the neural network responsible for specific biological function. The more entrainment pathways we discover, the more we cure diseases.

VI. ACKNOWLEDGMENT

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Factors Affecting the use of Long-Acting Reversible Contraceptive Methods among Married Women in Debre Markos Town, Northwest Ethiopia 2013

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Abstract- Long-acting reversible contraceptive methods can substantially reduce the high levels of unwanted pregnancy as well as maternal mortality and morbidity more in developing countries. The main objective of this research was to assess factors affecting use of long acting reversible contraceptive methods among married women of reproductive age group in Debre Markos town. Institution based unmatched case-control study was implemented from March 1- April 30/ 2013. A total of 120 long acting and 240 short acting contraceptive method users with 1:2 cases to control ratio were included in the study. Consecutive registration was used to select the study participants. Female data collectors were recruited and a semi structured pretested questionnaire using interview technique was used for data collection. Data entry and clearing was done using EPI data 3.5.1 and it was then transported to SPSS version 16 statistical packages for analysis. Women at age 20-24 years were 3.69 times more likely to use long acting reversible contraception than women at age 30-34.

Keywords: long acting, contraceptive, family planning, ethiopia, debre markos.

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Abstract- Long-acting reversible contraceptive methods can substantially reduce the high levels of unwanted pregnancy as well as maternal mortality and morbidity more in developing countries. The main objective of this research was to assess factors affecting use of long acting reversible contraceptive methods among married women of reproductive age group in Debre Markos town. Institution based un-matched case-control study was implemented from March 1- April 30/ 2013. A total of 120 long acting and 240 short acting contraceptive method users with 1:2 cases to control ratio were included in the study. Consecutive registration was used to select the study participants. Female data collectors were recruited and a semi structured pretested questionnaire using interview technique was used for data collection. Data entry and clearing was done using EPI data 3.5.1 and it was then transported to SPSS version 16 statistical packages for analysis. Women at age 20-24 years were 3.69 times more likely to use long acting reversible contraception than women at age 30-34. Women who had experience of discussion with their husbands about contraceptive were 1.8 times more likely to use long acting contraception as compared with those who did not have discussion.

Among several factors that determine the utilization of long acting reversible contraceptive methods age of women, occupation of the women and husband-wife discussion were found to be determinants of long acting reversible contraceptive method use. Family planning service needs to prepare advocacy to improve husband - wife communication to scale up the most effective & convenient service.

Keywords: long acting, contraceptive, family planning, ethiopia, debre markos.

1. INTRODUCTION

One of the Millennium Development Goals (MDGs) which most countries of the developing world strive to achieve by 2015 is MDG 5 that targeted reduction of maternal mortality by three-fourth between 1990 and 2015 [1].

According to world health organization report estimated 358,000 maternal deaths occurred worldwide in 2008, developing countries account for 99% (355,000) of the deaths. Sub-Saharan Africa and South Asia accounted for 87% (313,000) of global maternal deaths [2].

Ethiopia is one of the Sub-Saharan African countries with highest MMR which is 676 maternal deaths per 100,000 live births (Central Statistical Agency [Ethiopia] (March 2012). The vast majority of maternal and new born deaths can be prevented with proven interventions to ensure that every pregnancy is wanted by using the most effective modern Family planning methods and every birth is safe [3].

Family planning is a human right and is essential to women's empowerment. It is central to efforts to reduce poverty, promote economic growth, raise female productivity, lower fertility and improve child survival and maternal health. Family planning can prevent 20-35 % of all maternal deaths. By enabling smaller family size, family planning can help stabilize rural areas, slow urbanization and balance natural resource use with the needs of the population. Women and couples who want safe and effective protection against un wanted pregnancy would benefit from access to more contraceptive choices, including long acting and permanent contraceptive methods [4,5].

Modern contraceptives methods are divided into three: - Long acting reverse able contraceptive methods (IUCD & Implants); permanent contraceptive methods (tubal ligation & vasectomy) and short term contraceptives methods (Oral pill, inject-able, male& female condoms, foam tablet &cervical cap [4].

Ethiopia has set its own goals for population, which is articulated in the population policy as to reach a TFR of 4.0 and a CPR of 44% by 2015. By now the progress of CPR is increased to 29%. However, The CPR is highly dependent on short-term family planning methods (e.g. Nearly 21% for inject- able), and unmet need for family planning is still high for spacing births (16%) and limiting (9%) [1]. Recognizing this situation, the Federal Ministry of Health (FMOH), under Health service development program IV, has set a target CPR

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of 66 percent by 2015. Besides, the FMOH has considered the important role of long-acting non-permanent and permanent methods and aims to provide 20 percent of all family planning clients with these long-acting methods [5].

The Ethiopian RH strategy set provision of all family planning methods with special emphasis on long term and permanent methods as a key strategy of achieving one of its primary goals of reducing unwanted pregnancies and enabling individuals to achieve their desired family size [6].

The Ethiopian RH strategy set provision of all family planning methods with special emphasis on long term and permanent methods as a key strategy of achieving one of its primary goals. Creating wider

access to long-acting and permanent methods of contraception, which are the most effective contraceptives, can substantially reduce the high levels of maternal mortality and morbidity as well as unwanted pregnancies and unsafe abortion. In addition from the perspectives of unmet need for family planning; long acting contraceptives are more use full for spacing and limiting than short acting. However, currently Utilization of implants and IUD are 3 % and 2% respectively, which is very low (Federal Democratic Republic of Ethiopia, Ministry of Health [5, 7]. The main objective of this study was to assess factors affecting use of long acting reversible contraceptive methods in Debre Markos town, North West Ethiopia.

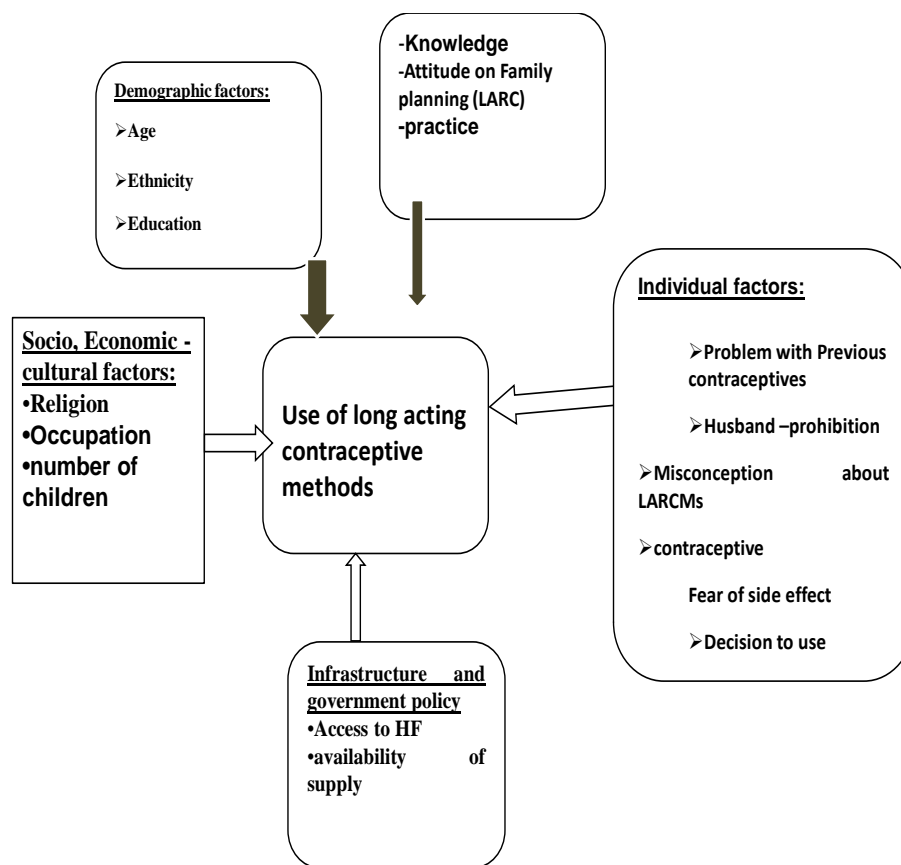


Figure 1 : Conceptual frame work adapttd from different literatures

II. METHODS

Study design

Facility based unmatched case-control study design was used. Cases were married women of reproductive age group who used long acting contraceptives during the study whereas controls were married women of reproductive age group who used short acting contraceptives (OCPs and inject-able).

a) Study area and period

The study was conducted in Debre Markos town from March 1- April 30/ 2013. The town is located 300 kilometers North West of Addis Ababa and 265 kilometers South East of Bahir Dar.

b) population

i. Source population

All reproductive age women using modern contraceptive methods residing in Debre Markos Town

ii. *Study population*

All married women using long acting reversible and short acting contraceptive methods who came for service to health facilities during the data collection period.

c) *Eligibility criteria*

i. *Inclusion criteria*

For cases: Women of reproductive age group who live in Debre Markos and were new users and resupply users of IUCD& Implant in the health institutions during the study were included in the study as cases.

For controls: Women of reproductive age group who live in Debre Markos and used short acting modern contraceptive methods(Oral Contraceptive Pills, condoms and inject-able) who were new and resupply users during the study were included in the study as controls.

ii. *Exclusion criteria*

Women who used emergency contraception & permanent method were excluded from the study. Women who had IUCD& implant inserted prior to the

i. *Assumptions*

Level of significance, $\alpha = 0.05$, Power, $1-\beta = 80\%$, Control to case ratio, $r = 1:2$

Proportion of exposure among non-users (controls), $p_1 = 0.21$

Proportion of exposure among users (cases), $p_2 = 0.33$

Population proportion, $P = p_1 + p_2 / 1 + r = 0.27$.

$$n = \frac{[Z_{\alpha/2} \sqrt{(1+1/r) p(1-p)} + Z_{\beta} p_1(1-p_1) + p_2(1-p_2)]^2}{(P_1 - p_2)^2}$$

Based on the assumption, that education is the major determinant factor for the utilization of Long term contraception. According to studies conducted in different parts of Ethiopia 15-27% of non-users and 26-39% of users of MC are exposed to formal education. Thus, based on the above findings and taking the averages, it was assumed in this study that, 21% of non-users and 33% of users are exposed to formal education. Hence, the sample size was calculated using EPINFO statistical software. So, the calculated value was 120 for cases and 240 for controls giving a total sample size of 360.

ii. *Sampling procedures and data collection*

Three health facilities were selected from the existing health facilities in the district, using purposive sampling method (by assessing the institutions, whether a range of methods for choice are available or not to the client to be select as a study sites). These were Debre Markos Family Guidance Association of Ethiopia Sexual Reproductive health Clinic / DM FGAE SRHC/, Debre Markos Health Center, Maristotops international Debre Markos SRH clinic. Users and non-users of Long term contraceptives who met the inclusion criteria were consecutively interviewed during study period.

study and came to the health centers for removal or follow up visits were also excluded from the study.

d) *Study Variables*

Dependent variable

Use of long acting reversible contraceptive methods.

Independent variables

i. *Demographic and Socioeconomic Variables*

Age, Marital status, Ethnicity, Educational status, Income, Occupation, Religion, Family size, Discussion with husbands on family planning and contraceptives

ii. *Variables related with reproductive history*

Number of pregnancies, History of births, Number of living children in sex, desired number of children in sex, Plan for future fertility.

e) *Sample size determination*

The sample size was calculated by using the formula for two populations in case-control study design.

Based on the following assumptions

Cases and controls were interviewed by trained clinical Nurses. Semi structured questionnaire was employed to collect data.

Data collectors were trained for three days on questions included in the questionnaire, on interviewing techniques, purpose of the study, and importance of privacy, discipline and approach to the interviewees and confidentiality of the respondents.

Before conducting the main study, pretest was conducted for 20 cases and 20 controls from one health facility

f) *Data entry and analysis procedures*

The collected data were cleaned and fed to Epi Data version 3.1 and analysis was done by using SPSS v 16.

g) *Operational Definitions*

i. *Long-acting reversible contraceptives*

are contraceptive methods in which their lengths of action range from 3-12 years (intrauterine devices and implants).

ii. *Short-acting contraceptives*

are contraceptive methods in which their lengths of action, ranges from 1day to 3 months .

iii. *Knowledge of modern family planning method*

If women recalled at least one modern contraceptive method and one source of contraceptive. (3)

Cases: Those married women who received long term reversible contraceptive methods during study period at three health institutions and who are living in Debre Markos Town.

Controls: Those married women who received short term contraceptive methods during study period at three health institutions and who are living in Debre Markos Town.

h) *Ethical Considerations*

Ethical clearance was obtained from the ethical committee of Debre Markos University. The study participants were informed about the objective, rationale and expected outcomes of the study and oral consent

was obtained either to participate or refuse for the interview.

III. RESULTS

A total of 120 cases and 240 controls were interviewed with response rate of 100% in both groups. Majority of women 119 (99.2%) of cases and 236(98.3%) of controls were Amhara by ethnicity and 111(95%) of cases and 231(96.2 %) controls were Orthodox Christian religion followers. With regard to age 63(52.4%) of cases and 75(31.2%) of controls were younger than 25 years, where as in occupation of the respondents 39(32.5%) of cases and 95(39.6%) of controls were house wives, 11(9.2%) of cases and 59(24.6%)of controls were merchants, 24(20%) of cases and 36(15%) of control were daily workers, 20(16.7%) of cases and 33(13.7%) of controls were employed and 26(21.7 %) of cases and 17(7.1%) of control were students. (Table 1)

Table 1 : Socio-demographic characteristics of the study participants, April to May, 2013

Variables		Cases 120 (%)	Controls 240 (%)
Age	15-19	14(11.7)	7(2.9)
	20-24	49(40.8%)	68(28.3)
	25-29	32(26.7)	81(33.8)
	30-34	8(6.7)	41(17)
	35-40	14(11.6)	33(13.8)
	>=40	3(2.5)	10(4.2)
Ethnicity	Amhara	119(99.2)	236(98.3)
	oromo	1(0.8)	3(1.2)
	Tigray	0	1(0.4)
Religion	Orthodox	114(95)	231(96.2)
	Protestant	2(1.7)	8(3.3)
	Muslim	4(3.3)	1(0.4)
Occupation	House wife	39(32.5)	95(39.6)
	Merchant	11(9.1)	59(24.6)
	Daily laborer	24(20)	36(15)
	Employed/GO	20(16.7)	33(13.7)
	Student	26(21.7)	17(7.1)
	illiterate	30(25)	55(22.9)
Woman education	Elementary school	32(26.7)	87(36.3)
	Secondary school	27(22.5)	60(25)
	College and above	31(25.8)	38(15.8)
	illiterate	24(20)	26 (10.8)
Husband education	Elementary school	31 (25.1)	77 (32.1)
	Secondary school	31 (25.8)	82 (34.2)
	College and above	34(28.3)	55(22.9)

The mean age was 25.3years (± 5.9) and 27.9 years (± 5.7 years) for the cases and controls respectively. Nearly forty-eight percent of married women who have no child were using long acting reversible contraceptive, 7(5.8%) of married women who have had 5 and above children were using long acting contraceptive methods, whereas in short acting contraceptive users, 83(34.5%), 104(43.3%), 38(15.8 %) and 15(6.3 %) were women who had no children, have had 1-2 alive children, have had 3-4 children. (Table 2)

Table 2 : Reproductive characteristics of long acting and short acting contraceptive users, in Debre Markos town, March 1- April 30/ 2013

Variables		Cases N 120(%)	Controls N(240%)
Age at 1 st marriage	<18	24(20)	41(17.1)
	≥ 18	80(66.7)	173(72.1)

Age at 1 st birth	<18	7(5.8)	21(8.8)
	≥18	50(41.7)	124(51.7)
No. of alive children	I didn't give birth	55(45.8)	83(34.6)
	I do not remember	8(6.7)	12(5)
	No birth at all	58(48 %)	83(34.5%)
	1-2 children	40(33%)	104(43.3%)
	3-4 children	15(12.5%)	38(15.8%)
	5 and above children	7(5.8%)	15(6.3%)
No. of children women wish to have in her life time	I don't want for ever	8(6.6)	11(4.5%)
	1-2 children	3 (2.5)	2(0.8%)
	3-4 children	35(29.1)	82(34.1%)
	>=5	39(32.5)	63(26.3%)
	Undecided	35(29.1)	82(34.1)

a) *Determinants of long acting reversible contraceptive method use*

Factors determine for long acting contraceptive method utilization like Age of women , age at first birth, number of alive children, number of children women

wish to have, religion, women education, husband education and husband-wife discussion were tested at p-value <0.2 for their association by using binary logistic regression analysis. (Table 3)

Table 3 : Bivariate and Multivariate analysis of determinants of long acting reversible contraceptive method use among married women in Debre Markos town, March 1- April 30/ 2013

Variables	Cases N=120	Controls N=240	COR (95%)	AOR (95%)
Age of respondent				
15-19	14	7	2.776(1.043,7.386)	2.398(.835,6.881)
20-24	49	68	1.00	1.00
25-29	32	81	0.548(0.316,0.950) **	0.702(0.387,1.275)
30-34	8	41	0.271(0.117,0.628) **	0.345(0.143,0.833)**
35-40	14	33	0.589(0.285,1.216)	0.693(0.319,1.506)
>=40	3	10	0.416(0.109,1.592)	0.532(.133,2.120)
Occupation of respondent				
House wife	39	95	0.262(.128, .536)***	.164 (.077,0.350)**
Merchants	11	59	0.133(.056, .318)***	.123 (.053,0.287)**
Daily workers	24	36	.436(.196, .970)***	.323 (.137, .763)**
employ	20	33	.396(.173, .905)**	.360 (.173, .747)**
Students	26	17	1.00	1.00
women education				
illiterate	30	55	.686 (.359,1.312)	.485 (.157, 1.504)
Primary	32	87	.463(.248, .862)*	.505 (.208,1.227)
Secondary	27	60	.576 (.299, 1.109)	.886 (.385, 2.042)
College and above	31	38	1.00	1.00
Husband-wife discussion				
yes	97	168	1.807 (1.062, 3.076)***	1.876(1.159, 3.036)**
No	23	72	1.00	1.00

p-value<0.05, * p-value <0.001

The results of multivariable logistic regression analysis showed that, Although many variables that were statistically significant at the bivariate Logistic regression were included in the analysis, only age of married women, occupation and discussion with husband were found to have statistically significant association to the long acting contraceptive use.

Women's at age 30 - 34 years were negatively associated with use of long-acting contraceptives methods [AOR (95%CI) (0.345,0.143, 0.833)]. Which

means thus women's at age 20-24 years were 3.69 times more likely to use long acting reversible contraception than women's at age 30-34. Regarding to occupation of married women, House wife, Merchant, Daily laborers & employed workers were negatively associated with use of long acting reversible contraceptives methods (LARCM) [AOR (95%CI) = .164 (.077, 0.350), .123 (.053, 0.287), .323 (.137, .763) & .360 (.173, .747) respectively. Which means students were 6.09 time more likely to use LARCM than House wife,

8.13 times more likely to use LARCM than Merchants, 3.09 times more likely to use LARCM than daily workers & 2.77 times more likely to use LARCM than employed workers.

Husband - wife discussion was found to be statistically significant, married women who had experience of discussion with their husbands about contraceptive were 1.8 times more likely to use long acting contraception as compared with those who did not have [AOR (95%CI) = 1.876(1. 159, 3.036)]

IV. DISCUSSION

The result showed that Married women in the study, 356(98.9%), 340(94.4%), 329 (91.4%), 218(60.6%) , 95(26.4%) and 80 (22.2%) of respondents mentioned by name inject-able, pills, implants, IUCD, bilateral tuba ligation(BTL) and condom as modern contraceptive methods respectively. which is higher as compared with finding in Mekele and Butajira(18,19) but this finding is similar with study done in Ethiopia EDHS 2011(3). This might be due to the continuous advertisement of these contraceptives through media increases through time.

Married women in the study were asked why they were using contraceptive ,the most commonly mentioned reason for using contraceptive among long acting contraceptive users was 101(84.2%) for child spacing and 19(15.8 %) for limiting ,while among short acting contraceptive users 202(84.2%) was for child spacing and 38(15.8%) was for limiting. This finding is in line with study done in Mekele and Butajira (18, 19).

The predominant short acting contraceptive method used 222 (92.5%) of married women was inject-able and in long acting contraceptive implants were also used by 100(83.3%) married women. This finding is in line with study done in EDHS 2011 (3). One hundred eighteen (98.3%) of cases and 239 (99.6%) of controls were satisfied by their services. This finding is in line with study done in

Results of regression analysis showed that utilization of long acting reversible contraceptive methods was depending on individual factors. After controlling other confounding factors age of women, husband-wife discussion and occupation of the women about LARCM were appeared to be the most important predictors of the utilization of LARCMs.

The use of a modern method among married women is lowest, among women aged 15–19, gradually increases, and then decreases again toward the end of the reproductive years.

Women's at age 30 - 34 years were less likely to use long acting reversible contraceptive methods as compared to women with age group of 20-24 [AOR (95%CI) = 0.345(0.143, 0.833)]. This result is in line with study conducted in Hohoe district of Ghana (26). Similarly study conducted in east Hararge Oromia zone revealed that age of mothers was found to be associated with the family planning method used. Those

who were in the age group fifteen to twenty four and twenty five to thirty four were more likely to use short term methods compared to mothers who were in the age group thirty five and above (40). Another study in China found prevalence of IUCD use increased with age up to ages 25-29 years, but declined thereafter which may reflect a switch from IUD to other methods such as sterilization (34).

Occupation of women was found to be significantly associated with long acting contraceptive use in this study, House wife, Merchant, Daily workers & employed workers were negatively associated with use of long acting contraceptives methods as compared to students [AOR (95%CI) = .164 (.077, 0.350), .123 (.053, 0.287), .323 (.137, .763) & .360 (.173, .747) respectively. Which means students were 6.09 time more likely to use LARCM than House wife, 8.13 times more likely to use LARCM than Merchants, 3.09 times more likely to use LARCM than daily workers & 2.77 times more likely to use LARCM than employed workers. This finding was not supported by other studies as far the investigator searches.

Another predictor that has also shown as an important influence on LARCMs utilization was husband-wife discussion. Those women having discussion with their husbands on contraceptive were more likely to use LARCMs than women who did not have discussion with their husbands on contraceptive. It is reasonable to expect that if there is no discussion between husband and wife, it has negative influences on using LARCMs.

This result is supported by studies in Butajira district & Nigeria; Discussion about the use of family planning between married women and their partners was significantly associated with the use of LARCM. (19, 25).

In this study, even though it is insignificant as the educational level of women increase their LAFP utilization also increased. This finding is consistent with a study in Butajira district (19), women with no child were more likely to utilize LAFP when compared to their counter parts This result is supported by studies in mekele.(18)

V. CONCLUSION AND RECOMMENDATIONS

In this study, age of women occupation of the respondents and husband-wife discussion were found to be independent determinants for long acting reversible family planning use. Emphasis has to be given to improving the norm of partner communication and women emplacement has to be encouraged.

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Comparative Study of Lipid Profile, Oxidant, Antioxidant Levels and Thyroid Hormone Status in Normal and Abnormal Pregnancy

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Abstract- Aim: The aim of the study is to evaluate thyroid status, Oxidative stress & lipid profile levels in abnormal and normal pregnancies.

Material and Methods: The study includes 25 abnormal pregnant women, 25 normally healthy pregnant women. Ages ranged from 20 to 30 years. Thyroid status was estimated by ELISA method. For determination of oxidative stress Malandialdehyde (MDA) is estimated as oxidants by TBARS, Uric acid is estimated by pap method, cholesterol & HDL-C by CHOD-POD method, triglycerides by GPO-POD method.

Results: In the present study, we observed that TSH is significantly increased compared to normal pregnancies TSH and FT4 are slightly decreased compared to normal pregnancies. In the present study cholesterol levels were increased in abnormal pregnancies compared to normal pregnancies and decrease in HDL cholesterol were observed in preeclamptic and eclamptic pregnant women.

Keywords: lipid profile, oxidant, antioxidant, abnormal pregnancy.

GJMR-E Classification : NLMC Code: WQ 200



Strictly as per the compliance and regulations of:



Comparative Study of Lipid Profile, Oxidant, Antioxidant Levels and Thyroid Hormone Status in Normal and Abnormal Pregnancy

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Conclusions: Altered Thyroid status which leads to hypothyroidism may be due to the loss of protein and protein bound hormones in urine in abnormal pregnancies compared with normals. Increased oxidative stress is due to increase in TSH levels which directly induces the pro-inflammatory cytokines. Study suggests that all abnormal pregnancies studied are associated with hypothyroidism.

Keywords: lipid profile, oxidant, antioxidant, abnormal pregnancy.

I. INTRODUCTION

The thyroid gland secretes hormones having important role in embryogenesis and fetal development during normal pregnancy. ⁽¹⁾ Thyroid function tests change during pregnancy due to the influence of two main hormones: human chorionic gonadotropin (hCG), the hormone that is measured in the pregnancy test and estrogen, the main female hormone. HCG can weakly turn on the thyroid and the high circulating hCG levels in the first trimester may result in a slightly low TSH. When this occurs, the TSH

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will be slightly decreased in the first trimester and then return to normal throughout the duration of pregnancy. Estrogen increases the amount of thyroid hormone binding proteins in the serum which increases the total thyroid hormone levels in the blood. ⁽²⁾

The most common cause of hyperthyroidism in pregnancy is Grave's disease and hypothyroidism is autoimmune thyroid disease (Hashimoto's thyroiditis). The complications associated with hyperthyroidism during pregnancy are first trimester spontaneous abortions, preterm deliveries, low birth weight infants, still births, neonatal deaths, fetal, neonatal hyperthyroidism and intrauterine growth retardation; in hypothyroidism are preeclampsia, preterm labour, placental abruption, threatened abortions, neonatal hypothyroidism, neonatal hyperbilirubinemia, postpartum hemorrhage and increased frequency of low birth weight infants. ⁽²⁾

The aim of the study is to evaluate thyroid status in abnormal and normal pregnancies by the estimation of FT3, FT4, and TSH, Oxidative stress is estimated by estimating MDA as oxidant & uric acid as antioxidant & lipid profile levels include cholesterol, triglyceride, HDL, Hb%. Abnormal pregnancies includes pregnancy induced hypertension (preeclampsia, eclampsia), gestational diabetes, hydroamnios, and abortions.

II. MATERIALS AND METHODS

Study Population: The study populations were investigated consisted of 50 women divided into two groups consisted of 25 abnormal pregnant women, 25 normally healthy pregnant women. Ages ranged from 20 to 30 years. The prospective study was carried out at the RIMS Hospital, Srikakulam, Andhra Pradesh, India, between January 2013 to June 2013. The study was approved by the Institutional Human Ethical Committee (IHEC). Informed verbal consent was obtained from all subjects. The objectives of the study were explained and a written concept was taken from each subject. The data on family history and personal history of diabetes, jaundice, hypertension and miscarriages were collected through standard questionnaire.

Biochemical Investigation: Serum FT3 ⁽³⁾, FT4 ⁽⁴⁾, and TSH ⁽⁵⁾ were assessed quantitatively using ELISA kits. The FT3 and FT4 were expressed as pmol/L, however the TSH was expressed as mIU/L. Total

cholesterol and HDL-C estimated by CHOD-POD method^(6,7) and Tgl by GPO – POD method⁽⁸⁾. For determination of oxidative stress Malandialdehyde (MDA) is estimated as oxidant by thiobarbituric acid reactive substance (TBARS)⁽⁹⁾, Uric acid is estimated by pap method⁽¹⁰⁾, Hb is estimated by Drabkin's method⁽¹¹⁾, Glucose is estimated by glucose oxidase and peroxidase method⁽¹²⁾.

Statistical Analysis: All data were expressed as mean \pm S.D. The 'P' value was used to compare mean values of abnormal pregnant women with normal pregnant women.

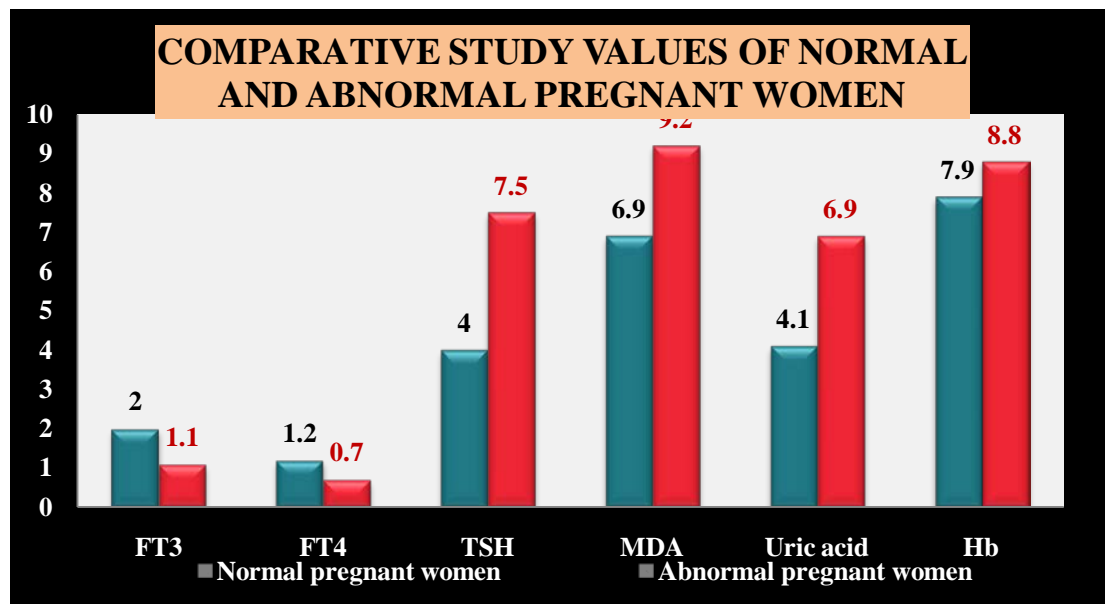
III. RESULTS

In the present study, observed that TSH (7.5 ± 3.93) is significantly increased compared to

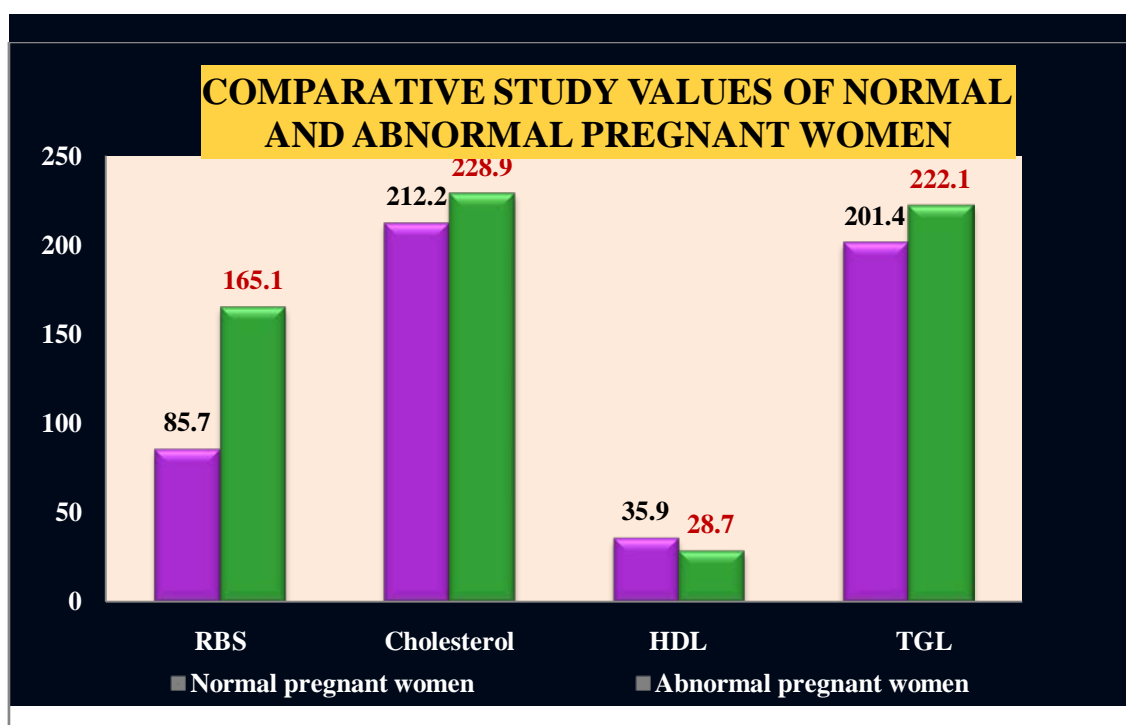
normal pregnancies TSH (4.0 ± 2.82). FT3 (1.1 ± 0.34) and FT4 (0.7 ± 0.24) are slightly decreased compared to normal pregnancies (2.0 ± 0.95) and (1.2 ± 0.26). In the present study cholesterol levels were increased in abnormal pregnancies (228.9 ± 47.12) compared to normal pregnancies (212.2 ± 38.95) and decrease in HDL cholesterol were observed in preeclamptic and eclamptic pregnant women. In the present study Hb levels were decreased in abnormal pregnancies (8.8 ± 1.7) compared to normal pregnancies (7.9 ± 1.9). The levels of MDA and uric acid were significantly increased in abnormal pregnancies. The glucose (RBS) levels were increased compared to normal pregnancies [Table 1].

Table 1 : Showing the comparative study values of Normal and Abnormal pregnant women with statistical analysis

Sl. No.	Parameters	Normal pregnant women		Abnormal pregnant women		Z-value	P-value
		mean	S.D	mean	S.D		
1	FT3	2.0	0.95	1.1	0.34	0.3409	0.3669
2	FT4	1.2	0.26	0.7	0.24	0.223	0.4129
3	TSH	4.0	2.82	7.5	3.93	3.6231	0.001
4	MDA	6.9	3.27	9.2	8.28	1.292	0.001
5	Uric acid	4.1	0.69	6.9	1.59	8.092	0.001
6	RBS	85.7	12.27	165.1	68.82	5.68	0.001
7	Cholesterol	212.2	38.95	228.9	47.12	1.366	0.0869
8	HDL	35.9	11.62	28.7	6.68	2.680	0.0037
9	TGL	201.4	60.47	222.1	45.80	1.364	0.0869
10	Hb%	7.9	1.98	8.8	1.70	0.344	0.3669



Graph-1



Graph-2

IV. DISCUSSION

The present study was conducted to find out the thyroid status in abnormal pregnancies. Pregnancy is associated with substantial but reversible changes in thyroid function. The metabolic demands and hormonal changes which occur as a result of pregnancy induce a complex alteration in thyroid function. Many authors earlier reported the hypothyroidism in abnormal pregnancy^(13, 14, 15, 16). In the present study which included a group of 25 abnormal pregnant women, it is observed that TSH (7.5 ± 3.93) is significantly increased compared to normal pregnancies, TSH (4.0 ± 2.82). FT3 (1.1 ± 0.34) and FT4 (0.7 ± 0.24) are slightly decreased compared to normal pregnancies (FT3 2.0 ± 0.95 and FT4 1.2 ± 0.26).

Preeclampsia women have high incidence of hypothyroidism that might correlate with the severity of preeclampsia. It has been suggested that reduced serum concentrations of thyroid hormones in toxemia may be due to the loss of protein and protein bound hormones in urine. Modest decrease in thyroid hormones with concomitant increase in TSH levels in maternal serum correlated with severity of preeclampsia (or) eclampsia and high levels of endothelia. The endothelial cell dysfunction plays an important role in the pathogenesis of preeclampsia. Nitric oxide, a vasodilator released from the endothelial cells, regulates secretion of thyroid hormones by modulating regional blood flow. The decrease in thyroid hormones with significant increase in TSH has been found to be correlated with the severity of preeclampsia.

In the present study cholesterol levels were increased in abnormal pregnancies compared to normal pregnancies and decrease in HDL cholesterol were observed in preeclamptic and eclamptic pregnant women. Oestrogen is responsible for induction of TG and HDL and suppression of serum LDL and oestrogen levels falls in preeclampsia. The low level of HDL in preeclampsia is however not only because of hypoestrogenaemia but also due to insulin resistance. In the present study Hb levels were decreased in subjects compared to normal pregnancies. Pregnant women are often iron deficient, and iron deficiency had adverse effects on thyroid metabolism. Poor maternal iron status predicts both higher TSH and lower TT4 concentration during pregnancy. Many authors reported increased MDA levels in abnormal pregnancies⁽¹⁷⁾. In the present study also MDA levels is significantly increased (9.2 ± 8.28). The elevated levels of free radicals as evidence by elevated TBRS (thiobarbutric acid reactive substance) they are products of lipid per oxidation effecting cell membrane. Uncontrolled lipid peroxidation is a key contributing factor to pathophysiological condition of preeclampsia.

Uric acid levels were increased in abnormal pregnancies compared to normal, uric acid is one of the important redox systems in the body. Uric acid acts as an extracellular antioxidant because of its ability to remove singlet oxygen hydroxyl and peroxy radical. The current study assessed the effects of TSH on endothelial function, and its possible involvement of inflammation and oxidative stress. Raised TSH levels directly induces TNF α secretion by bone marrow cells and IL 6 by

adipocytes TNF α is a pivotal NO-controlling cytokine, and elevated TNF α levels may promote the expression of inducible NO synthase, leading to increased oxidative stress. So raised serum TSH levels leads to impairment of endothelium dependent vasodilatation, possibly through the induction of low grade inflammation and reduced NO availability by oxidative stress.

In some pregnant women oxidative stress may lead to dysmorphogenesis, abortions and intrauterine growth restriction. The study summarized the role of free radicals (or) reactive oxygen species mediate their action through many of the pro-inflammatory cytokines and this mechanism has been proposed as a common underlying factor for endometriosis, ovarian cancer, polycystic ovary disease, and various other pathologies affecting the female reproductive process.

V. CONCLUSION

TSH is significantly elevated and FT3, FT4 were decreased slightly in abnormal pregnancies compared with normals. TBRS (malondialdehyde) as marker of lipid peroxidation was elevated significantly. Antioxidant uric acid is elevated significantly. The rise in antioxidant is probably to compensate the increased peroxide load in abnormal pregnancies. Hb levels are decreased and RBS levels are significantly increased in abnormal pregnancies. Cholesterol, TGL levels were increased and HDL levels were significantly decreased in abnormal pregnancies. Study suggests that all abnormal pregnancies studied are associated with hypothyroidism.

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Obstetric Care Performance: A Situational Analysis of 24x7 Primary Health Centres from Gujarat, India

By Sandul Yasobant, Kranti Suresh Vora & Dileep Mavalankar

Indian Institute of Public Health, India

Abstract- Primary Health Centers are the cornerstone of rural healthcare in India. Updating these centers to provide round the clock services to reduce the unmet need for maternal healthcare; is an important objective of National Rural Health Mission since 2005. Yet, functionality of PHCs to provide 24x7 services remains poor due to several health system issues. The present cross-sectional facility based study evaluates the functioning of rural 24x7 primary health care facilities in 3 districts of Gujarat for obstetric care performance and its predictors. The study used pretested questionnaire for collecting data from all PHCs of study areas in 2012-13. Obstetric care performance was measured as number of deliveries conducted in last 3 months. Current study found that the obstetric care performance is independent of infrastructure or logistics situation but highly dependent availability on the skilled human resource. There is urgent need for a systematic study to evaluate performance of public health facilities along with use of routinely collected data to make the system efficient.

Keywords: *obstetric care performance, primary health centres, 24x7 PHCs.*

GJMR-E Classification : *NLMC Code: WQ 400*



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Sandul Yasobant^α, Kranti Suresh Vora^σ & Dileep Mavalankar^ρ

Abstract- Primary Health Centers are the cornerstone of rural healthcare in India. Updating these centers to provide round the clock services to reduce the unmet need for maternal healthcare; is an important objective of National Rural Health Mission since 2005. Yet, functionality of PHCs to provide 24x7 services remains poor due to several health system issues. The present cross-sectional facility based study evaluates the functioning of rural 24x7 primary health care facilities in 3 districts of Gujarat for obstetric care performance and its predictors. The study used pretested questionnaire for collecting data from all PHCs of study areas in 2012-13. Obstetric care performance was measured as number of deliveries conducted in last 3 months. Current study found that the obstetric care performance is independent of infrastructure or logistics situation but highly dependent availability on the skilled human resource. There is urgent need for a systematic study to evaluate performance of public health facilities along with use of routinely collected data to make the system efficient. Posting of skilled health providers and accurate documentation would help to improve the obstetric performance and increase access to primary care for rural Indians.

Keywords: *obstetric care performance, primary health centres, 24x7 PHCs.*

I. INTRODUCTION

India contributes one-fifth of the global burden of direct maternal deaths. National government has made efforts since independence in 1947 to improve health infrastructure and access to primary care including delivery care.

However India continues to face challenges in improving key maternal health indicators such as adequate antenatal care coverage, institutional deliveries^[1]. Low Utilization of health care services is an important issue in India with majority of mothers not receiving adequate antenatal care and an unacceptable proportion of home deliveries^[2]. Despite having tiered healthcare system to improve access for the basic healthcare needs including obstetric care at the community level, significant proportion of population in

rural areas do not have round the clock access^[3]. Primary Health Centres (PHCs) comprise the second tier in rural healthcare structure envisaged to provide integrated curative and preventive healthcare. A medical officer, who is a basic medical graduate, is in charge of the PHC supported by fourteen paramedical and ancillary staff. It acts as a referral unit for six sub-centers that are based at the village level. It has four to six beds for inpatients. The activities of PHC involve curative, preventive, and family welfare services in accordance with the Indian Public Health Standards (IPHS)^[4]. Currently, India has 24,049 PHCs as per population based norms of one PHC per 30,000 populations^[5]. Under the National Rural Health Mission, launched in the year 2005, fundamental changes were made in the health care delivery system with a view to make it accountable, accessible and affordable system of quality maternal health care^[6].

Gujarat, a western state in India is one of the better performing states with more than 75% institutional deliveries^[7] and maternal mortality ratio of 122^[8]. Although it is not one of the NRHM high focus states but it does include many remote/geographically difficult and poorly served areas^[9]. The state has taken steps to strengthen its PHC services by upgrading about 100 PHCs to provide round-the-clock obstetric services (24X7), unfortunately only half of them remain functional in the year of 2013-14^[9]. Even the functional PHCs have poor obstetric performance as the proportions of deliveries conducted in PHCs are very low at 3%^[10]. Failure to deliver obstetric care at the grass root level despite significant improvements in infrastructure and numerous financial assistance programs deserve urgent attention.

To explore the issue, recently the Planning Commission of India carried out a study to evaluate the functionality of 24x7 health care facilities in high focus states and found that health system issues such as infrastructure and logistics that adversely affected the performance of these facilities^[11]. In our knowledge, no such study has been conducted in better performing states such as Gujarat. The objective of current study is to make a comprehensive evaluation of the functioning of rural 24x7 health care facilities regarding obstetric care performance and to understand its predictors.

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II. METHODOLOGY

Current study included all functional 24x7 PHCs (32 facilities) located in the rural areas of 3 study districts (Surendranagar, Sabarkantha, Dahod) of Gujarat. The facility-based cross-sectional study conducted between May 2012 and April 2013. A semi-structured and pre-tested study questionnaire translated in vernacular language (Gujarati) was used by trained nurses. Some data from records of the facilities was captured by the data collectors with help of pretested tool. Obstetric performance is defined as number of deliveries conducted in last 3 months which is collected by data collector and verified with facility records.

Data were summarized using the descriptive statistics and linear regression was done for obstetric care performance as a dependent variable for predictors such as facility infrastructure, equipment and skilled human resources for delivery care. Pearson's Correlation test was performed to know the level of prediction for significant predictors. The data analysis carried out using R version 3.0.1 software.

III. RESULTS

The study results show more than half PHCs are located within village boundary. Basic amenities such as

a separate labor room, running water supply, electricity/backup generator and toilets attached to labor room are available in more than 50% of the facilities. Only 50% of PHCs have designated baby care unit/area and basic level equipment as per IPHS are available in about 70% of PHCs [10]. Infection prevention equipment such as sterilizer is available in 56% and formalin chamber is available in only 22% of the facilities surveyed while sterile gloves for delivery are available in 69% of the PHCs. On an average 4 plus beds are available for about 41 deliveries performed over 3 months. These results show adequate infrastructure for delivery care in majority of the PHCs surveyed irrespective of obstetric performance.

Results of the current study show the number of healthcare providers and years of experience are higher among PHCs with better obstetric performance. Difference in number of medical officers and years of experience of staff nurse are significant predictors of obstetric performance. Pearson's correlation coefficient indicates that about 48% of variance in the obstetric performance of study facilities is explained by differences in experience of staff nurses ($r=0.48$). These findings highlight the importance of having adequate numbers of well experienced human resources to improve the obstetric performance of a health facility.

Table 1 : Descriptive statistics at PHC 24x7s

Basic Amenities	Available (%)
Separate Delivery Room	100
Power Backup for delivery room	63
Water Supply to delivery room	59
Drinking Water Provision	84
Adequate Lighting of Delivery Room	69
Toilet Privacy Available for Women in Labor	84
Equipment	Available (%)
Sterile Gloves for Delivery	69
Episiotomy Scissors	72
Baby Care Unit	50
Performance Statistics	Median (Min-Max)
Total delivery performed in last 3 months	41 (1-252)
Total No. of Beds	4 (1-7)
No. of Doctors	1 (0-2)
No. of Nurses	3 (1-7)
Experience of Doctors (in yrs.)	9 (1-33)
Experience of Nurses (in yrs.)	7 (1-30)

Table 2 : Predictor Based Regression Analysis for Obstetric Care Performances

Variables	Estimate	Std. Error	p-value
Power Backup for delivery room	16.35	23.31	0.488
Water Supply to delivery room	-65.70	19.81	0.002**
Adequate Lighting of Delivery Room	-89.86	18.25	0.000***
Toilet Privacy Available for Women in Labor	-12.26	38.96	0.755
Baby Care Unit	-47.44	21.04	0.031*
Sterilizer/ Boiler	-43.67	21.50	0.091
No. of Medical officers	50.91	18.69	0.011*
No. of Nurses	10.76	8.43	0.211
Experience of Medical Officers	0.03	1.33	0.978
Experience of Nurses	4.05	1.42	0.007**

[†] $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

IV. DISCUSSION

Under the NRHM, the federal/national government is providing major financial support to states to strengthen their health systems with emphasis on new constructions and up gradation of PHCs [12]. Historically, national/state governments of India as well as developmental agencies such as World Bank have concentrated on infrastructure development to improve healthcare service delivery while generally disregarding the development of skilled human resources for health [13, 14]. Previous research and government data suggests that infrastructure in public health facilities has significantly improved in last decade [15, 16]. Current study found that almost all of the surveyed PHCs have basic amenities required for providing obstetric care, which may be the reason that infrastructure did not have major bearings on obstetric performance of facilities.

In current study, a significant proportion of variance in the obstetric performance of surveyed PHCs was seen in the years of experience of staff nurses. Also, the regression analysis showed that the number of medical officers and years of experience of staff nurses are significant predictors of obstetric performance at the

PHC level. Lack of qualified human resources for health care (HRH) is a major limiting factor in implementing health policies and health reforms in the developing world [17]. One of the major HRH challenges is the availability of qualified/skilled staff. Current study findings highlight the importance of ensuring availability of skilled and experienced healthcare providers to make facilities functional for obstetric care.

In India, public health is a state subject hence states decide strategies to improve health of the local population even if funding is from national government. In 2012, about 33% of PHCs in Gujarat did not have any medical officers, the situation is worse than 2008 when only 5% of PHCs were without a doctor [18]. It should also be noted that majority of PHCs in Gujarat have only one medical officer and proportion of female medical officers is even lower. It is difficult to provide round the clock obstetric care with only one healthcare provider. Development of human resource for health in the state is limited to establishing new medical colleges and training of medical graduates to provide emergency obstetric care while ignoring training of skilled birth attendants such as staff nurses and midwives [19].

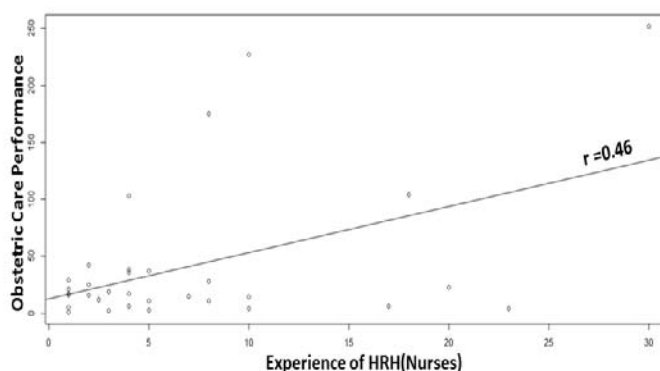


Figure 1 : Correlation of HRH Experience and Performances at PHC 24x7s

Limitation of this study is cross sectional nature and inclusion of only 3 districts of Gujarat. There is a need to do a prospective study with more in depth evaluation of functionality of these facilities in all the

districts of Gujarat especially in context of human resources. Despite this limitation, the findings of the study are valuable for evidence generation and informing policy making and program implementation.

V. RECOMMENDATIONS

Gujarat needs to improve human resources management to increase the proportion of deliveries taking place in PHCs and provide basic maternal health care at the community level. There is a need for evidence based human resource policy and its implementation at the grass root level to improve current situation. Gujarat needs to employ innovative strategies to ensure posting of adequate numbers of skilled and experienced health care providers who could be a medical graduate or trained midwives to all the PHCs to ensure round the clock obstetric services. Tamil Nadu has posted 3 staff nurses to provide 24x7 delivery care in PHCs and the intervention has improved provision of obstetric services at the community level [20]. Such innovations can be replicated to implement low cost evidence based strategies and increase obstetric performance of PHCs.

VI. CONCLUSIONS

Current study emphasizes the issue of human resources for health and its impact on the functionality of health facilities to provide round the clock obstetric care. As a result of past and present national and state level programs, infrastructure of majority of primary health centers has improved significantly and is adequate to provide basic delivery care. Yet, proportion of deliveries taking place in these grass root level facilities is dismally low. Gujarat needs to improve its human resources management for obstetric care and ensure posting of adequate numbers of skilled providers for effective tiering of delivery care.

VII. ACKNOWLEDGEMENT

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VIII. CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

a) Authors Contribution

Conceived and designed the study: SY KV DM. Performed the experiments: SY KV. Analyzed the data: SY KV. Wrote the paper: SY KV DM.

b) Source of Funding

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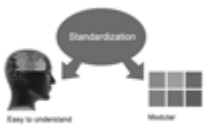
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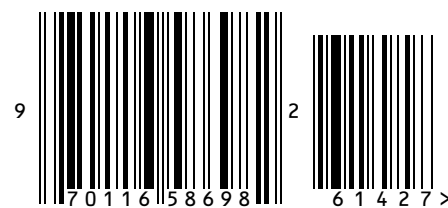
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