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Comparison of causes and risk factors in middle aged and young women

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Abstract

Infertility is a common problem that persists in 80 million of the people in the world. It is characterized by failure to conceive within a year or more with the continuous efforts of conceiving. The present study is designed to compare causes and risk factors of infertility in middle aged and younger females of Karachi, Pakistan. A survey based research of sample size 102 with inclusion criteria of age 18-40 years was conducted in local government hospitals. Subjects were divided into 2 groups of age 18-27 and 28 – 40 years respectively. A detailed questionnaire investigating complete medical and menstrual history, fertility history, other metabolic disorders (like diabetes, hypertension, anemia, PCOS) and life style of patients was evaluated. Our study concludes that age is the most important determinant of fertility because with increase in age other factors associated with infertility also become intense and causes severe hindrances in conception.

Keywords: PCOs, Age related disorders, menstrual disorders, and metabolic disorders

Introduction

An infertile person is unable to conceive within year or more with the continuous practice of intercourse. 80 million people in the world face fertility issues. In Pakistan its prevalence is 21.9 %. Both male and female factors can contribute to the cause of infertility. If the women has no history of previous conception, this type of fertility is Primary infertility. If the woman had already been pregnant but her pregnancy was brought to the terms of miscarriage and then she is not able to conceive again, then this is referred to as secondary infertility. When the actual cause of infertility is ambiguous, this is unexplained infertility. If each one of the couple is having fertility issue or if female is having more than one reason for infertility then this is referred to as combination fertility.

Infertility is linked closely with Polycystic Ovary Syndrome (PCOS). PCOS is known to enhance androgen level causing anovulation. It induces infertility by affecting the reproductive system of women during their reproductive age. PCOS is closely related with insulin resistance and obesity and involves primary ovarian dysfunction. 40% couples experience PCOS linked infertility. 30% infertility is linked with issues like oligomenorhea, amenorrhea, anovulation, fallopian tube obstruction, and endometriosis. The disturbance in FSH/estrogen feedback loop because of non-functioning premature follicles in premature ovarian syndrome is the dominant reason for infertility. Endometriosis which is abnormal implantation of endometrial mucosa in other than uterus has a negative impact on fertility. Fallopian tube obstruction resulted from inflammation or Chlamydia is another important factor which leads to infertility. Hyperprolactinemia interfere the action of gonadotropin at the ovarian level inducing abnormal secretion of gonadal steroid which in turn disturb feedback mechanism at hypothalamic and pituitary level leading to lack of gonadotropin cyclicity and then infertility. Prolactin also reduces estradiol production increasing the risk of infertility. Congenital defects in women such as abnormal tubes and septate uterus can bring the terms of conception to miscarriage or fecundity. Uterine fibroids also increase risk of infertility as they interfere in implantation of a fertilized egg and they are common in women of age 30-40 years. 50% women with age 45 or old are more at risk of miscarriage as compared to women with age 20-29 years. Certain medications may also induce temporary infertility. Women using oral contraceptives to avoid pregnancy face more difficulty in conceiving on withdrawing them.

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The risk of infertility increases with the incidence of anemia or folate deficiency. Hyperinsulinemia and DM type II happen to increase androgens which impair infertility. Diabetes is also known to delay the onset of menarche and hastens the onset of menopause. Any incidence of surgery, infection, inflammation, or trauma presents the chance to develop adhesions as an inflammatory response to tissue damage. Insertion of Intrauterine devices presents the risk of developing Pelvic inflammatory disease (PID). Adhesions in places as uterine walls, pelvic region, and ligaments can also provoke Pelvic inflammatory disease, tubal obstruction, and bowel obstruction, polyps, increasing risk of miscarriages, implantation problems and infertility. Hyperthyroidism and hypothyroidism both affect the ovarian functions, menstrual cycles, and spermatogenesis. Iodine deficiency is well known to impair fecundity. Hyperandrogenemia is closely associated to a variety of reproductive problems including infertility, anovulation and recurrent miscarriages. Acne and hirsutism are the best indicators of high androgen levels which hinder implantation of an embryo in the first place because they reduce endometrial blood flow and leads to the depletion of the endometrial receptivity biomarkers reducing uterus receptivity. With increasing age the number and quality of oocytes reduces which reduces fecundity. 40% of infertility problems are linked with male factors such as azoospermia, oligospermia, Asthenospermia, teratospermia and retrograde ejaculation. Contents in cigarette smoke are known to impair menstrual cycles. Smoking women have early menopause than non smoker. Two of the common contents, cotinine and cadmium are found in the follicular fluid of smoking women. Cadmium in cigarette smoke degrade the intrafollicular processes in smoking females. Obesity is also associated with infertility as it impairs menstrual cycles and also increase risks of endometrial polyps and ovulation. As obesity is diet and nutrition induced, high intake of fatty dairy products can cause anovulatory infertility. It has been found that Psychological stress has profound effects on endocrine and immune systems. It suppresses follicle growth and sperm production because the body's response to stress negatively effects on reproductive axis and cause Hyperprolactinemia and infertility. High Caffeine intake in females hinders ovulation and corpus luteal function and elevates follicular E2 levels. High caffeine intake delays the conception in women. It impairs hormone levels and is associated with tubal factors and endometriosis. Alcohol intake disturbs estrogen and FSH level. Hence the maturation of follicles and eggs is badly suppressed. High alcohol intake presents threat to pregnancy. Leptin is an important hormone for ovulation and is found in fat cells. Inadequate food intake can diminish body's fat store that are responsible to stimulate these hormones vital for normal reproductive cycles. Reduced fat stores also induce emotional stress or physical stress both of which are responsible to cause amenorrhea, an important cause of infertility.

Methodology

A survey based prospective study was conducted in local government hospitals in Karachi during Jan-Dec 2011. The sample size taken was 102. The inclusion criteria were women of age 18-40 years. Subjects were divided into two groups, Patients with age 18-27 years and patients with age 28-40 years. A detailed questionnaire through which complete medical history (which included menarche age, date of last menses, duration of blood flow, pain during menses and before menses), fertility history (that included miscarriage history, c-section deliveries, premature deliveries), other medical conditions (like diabetes, hypertension, anemia, PCOs, endometriosis, uterine fibroids, cancer, thyroid disease or any previous surgery) and life style (smoking, caffeine intake, exercise, use of birth control pills etc) and conditions such as obesity, acne or hirsutism of patients were taken.

Results and Discussion:

Mean age of group I (18-27) was 23 +_0.677 and Group II (28-40) was 32 +_0.830 (Table I). A higher number of both groups belonged to lower socioeconomic status. Subjects belonging to middle class, lower middle class and higher class socioeconomic status of group I were 17.6%, 70.6% and 11.8% respectively (Table I). Dysmenorrhea was found to be greater in both groups i.e. 31.25% in group I and 44.4% in group II. Oligomenorhea was found to be 18.7% in group I and 50 % in group II (FIG: 1). other research studies have also suggested that hirsutism and oligomenorhea is more common in middle aged women. The incidence of primary and secondary infertility is found higher in females of group II. In group II, 55.5% and 62.5% of primary and secondary infertility is found respectively, whereas in Group I the incidence of primary and secondary infertility is found to be 37.5% and 44.4% respectively (FIG: 2). Other studies also suggest that age is the significant factor of primary and secondary infertility The frequency of miscarriages is found 40 % in group II and 25 % in group I (FIG: 3). Another research study also shows that risk of miscarriage is 10% in women aged 20-29 years, whereas 45 or older women have 50% risk of miscarriages. Diabetes, hypertension and PCOs is found to be 55.5%, 50% and 18.75% in group II respectively whereas in group I 31.25%, 43.75%, and16.6% was found respectively (FIG: 4). Diabetes Mellitus is correlated with many other pathologic conditions. Many studies report that with increase in age risk of Diabetes also increases which eventually leads to infertility. In our study more middle aged women have reported DM. Since PCOS and Diabetes are closely linked, increased risk of diabetes in middle aged women increase the risk of PCOS as well. Endometriosis induced infertility may be due to some enigmatic reasons. Endometriosis is linked with retrograde menstruation that causes detrimental effects, ultimately causing infertility. This is observed more in young age because with increase in age reduction in estrogen levels decreases menstruation flow. Our study shows that prevalence of endometriosis is 6.25% in group I and 2 % in group II (FIG: 4). Uterine fibroid occur predominantly in premenopausal women aged 35 and older because growth of fibroids depend on estrogen and progesterone level. Our study shows that 5.5% of women aged 27-40 years had uterine fibroids (FIG: 4). In our study 87.5% anemia was found in group I and 66.6% in group II (fig: 4). Anemia induced infertility is seen common in young age women as frequent loss of blood in rapidly growing phase develop the risk of infertility and miscarriages. A research study shows that 86.1% women during their 20s and 30s experience Acne. Acne is an indicator of high androgen levels which is a major cause of infertility. In our study 43.75% infertile women of group I

experience acne whereas only 27.7% of group II experience acne (FIG: 5). Hirsutism is an indicator of PCOS and PCOS is common in middle aged women. The results of our study shows that hirsutism was 27.7% in middle aged women of group II and 25% in group I. Stress was found to be 62.5% in group I and 66.6 % in group II (FIG: 5). 12.5%

subjects in group I whereas 11.5 in group I have had used oral contraceptives (FIG: 6). This may be due to the fact that young females peruse oral contraceptive measures to avoid pregnancy then later on discontinuing them face difficulty in conceiving.
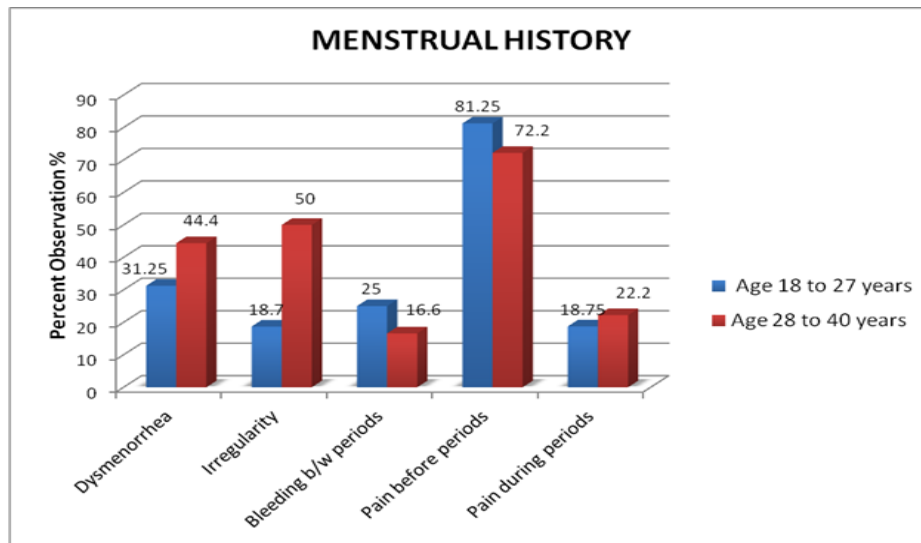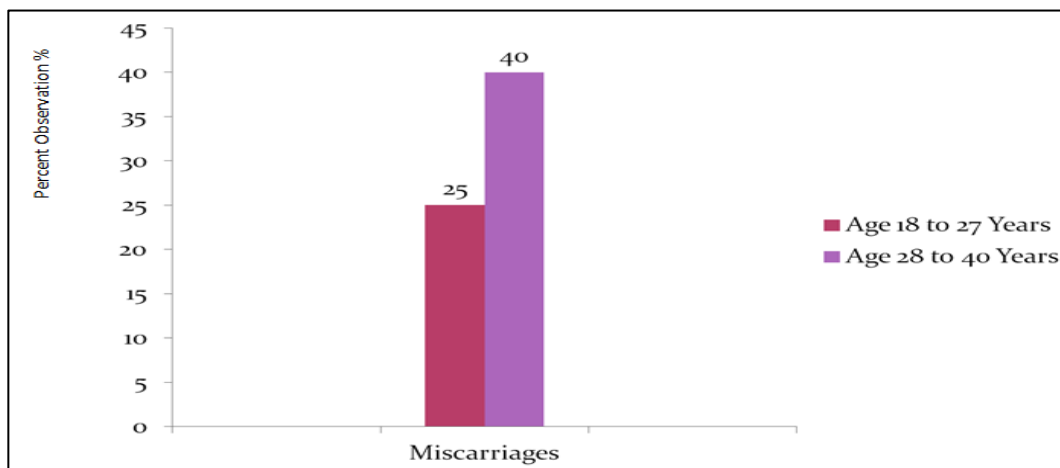

Fig 1
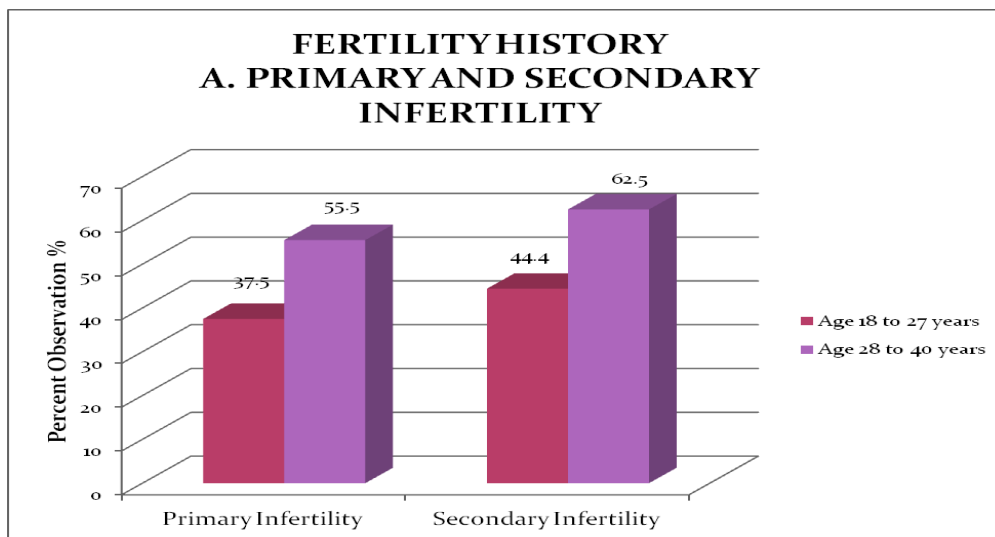
Fig 2

Fig 3: Numbers of Miscarriages
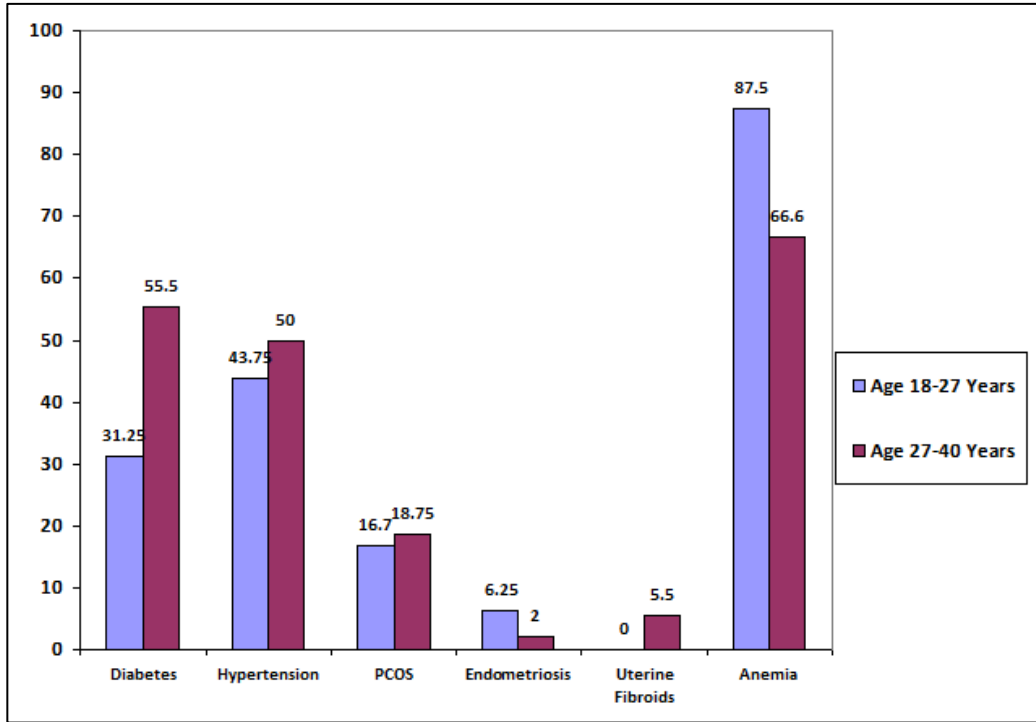
Fig: 4 Medical History

Fig 5

Fig 6

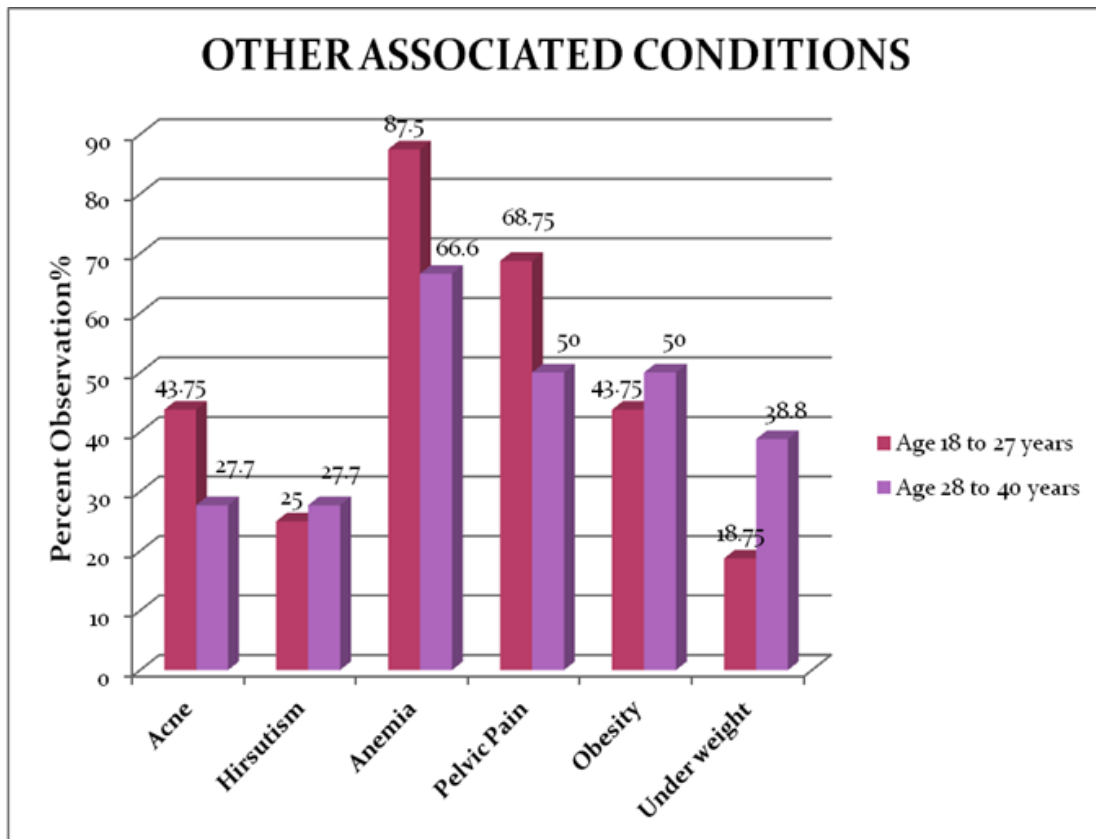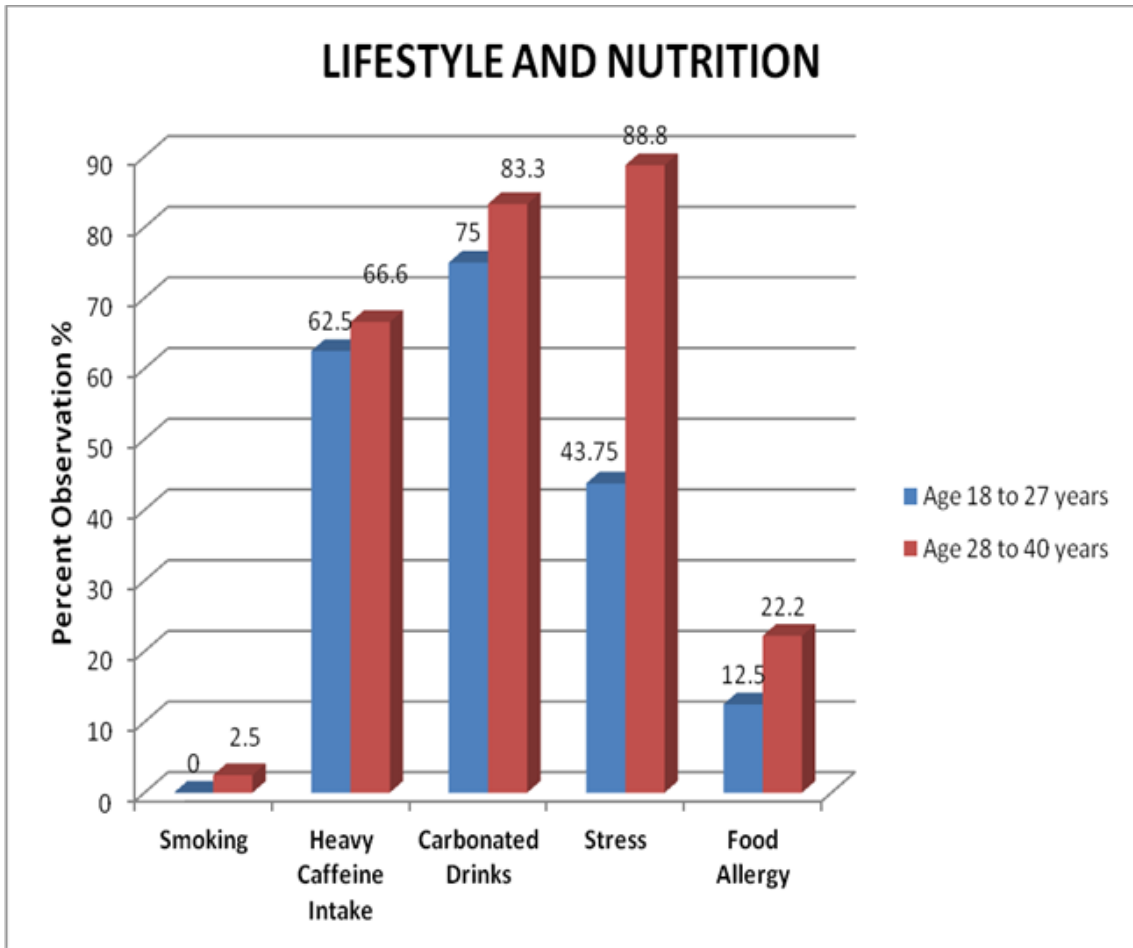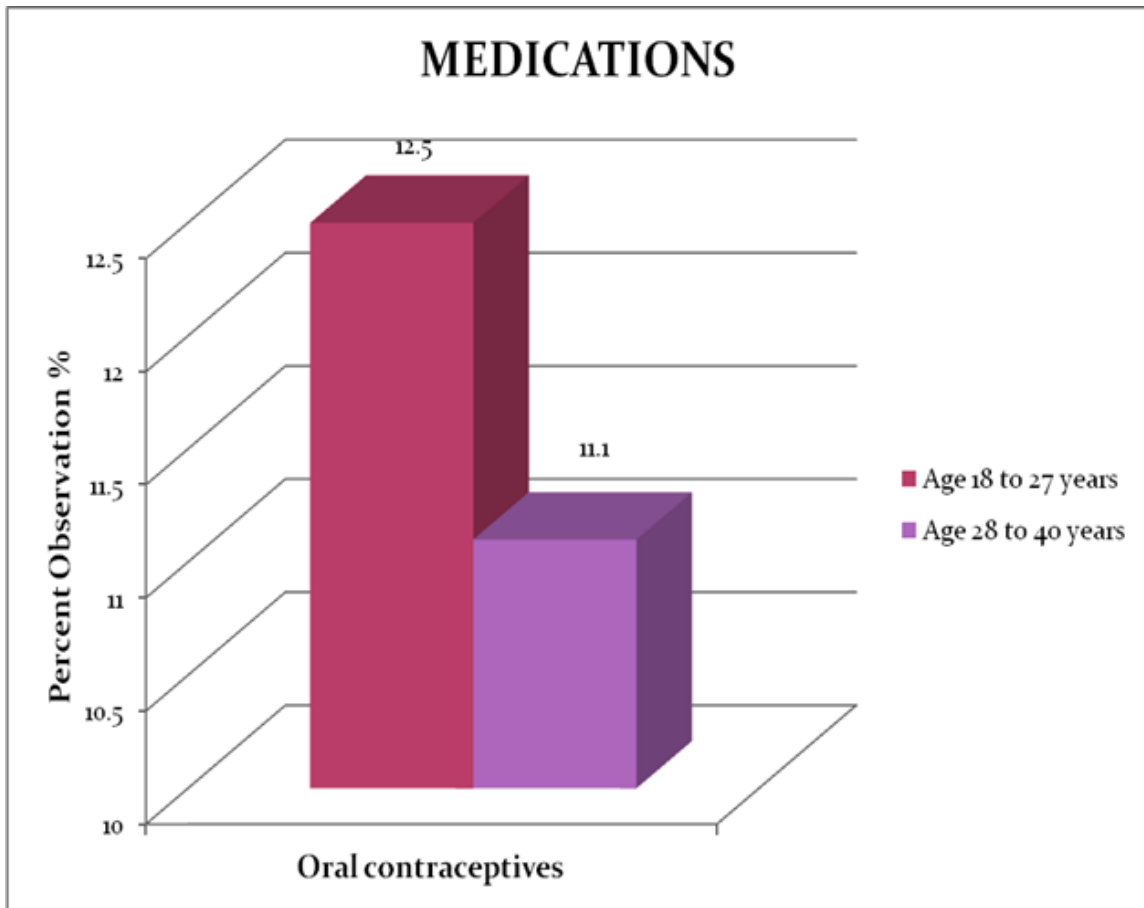**Fig 7**

Limitations of the Study
The study was conducted in a local government hospital and therefore, most of the patients belonged to lower socioeconomic status. This study was conducted in a short time span and could not include a large number of patients.

Conclusion
Female age is the single most important determinant of spontaneous as well as treatment-related conception with a gradual decline in fertility especially after the age of 35 years. The fundamental aspect of reproductive senescence in women is a decrease in the population of ovarian follicles. The causes and risk factors of infertility in middle aged women and younger women are dissimilar as with increase in age the complexity of the causes of infertility also increases. The evaluation of infertility should be initiated earlier when the female partner is older than 35 years or if the woman has a historical factor that is linked with infertility.

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