Original Article

A Successful Pregnancy Outcome In Patient With Single Ovary In One Cycle Of IVF/ ICSI: A Case Study

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Abstract

This case study is of 31 years old infertile women who underwent the procedure of partial ovariectomy visit WARDHA TEST TUBE BABY CENTRE[WTTBC] with her husband [36 years old] for the treatment of infertility. The relatives of this couple already took treatment from WTTBC so through them they got to know about this place. Due to failure of two successive iui cycles in previous hospital the couple is disappointed and in sorrow. After visiting the WTTBC a new ray of hope is awakened in the couple. After knowing and undergoing the complete procedure the female gave birth to the baby. As a nulliparous woman after facing tremendous criticism from society and relatives in gestation period of 40 week, she gave birth to a girl child. This increases the trust and bond between the doctor and a patient, we can admire this case of oophorectomy of single ovary as a therapeutic victory for WTTBC and for the patient also. Being an infertile and having various pathologies associated with her ovaries, she faced a lot. Generally, the women's go through mental and physical torture, also depression which leads to arise issues of health.bt the determination power of the patient and the urge of having own child leads to a positive outcome of a successful pregnancy and delivery of a healthy child. Ovariectomy has various causes like endometriosis, torsion, PCOS etc results into dropping in various levels of hormones Affect the positive outcome of pregnancy.Tubal blockage can be treated and a women can get pregnant with present ovary if it's morphologically normal and proper in function.

Keywords- Oophorectomy, Ovariectomy, Pregnancy, Fertilization, IVF, ICSI

INTRODUCTION

Effects of the today's hectic vast and busy lifestyle can be seen on the body of human being. The effects are mostly affecting the Reproductive health. Specially the health of women is getting affected more. Increasedcompetition in every field, negligence towards healthy diet affects the women's health. Living and working environment affects the Reproductive health. various habits like smoking, drinking alcohol,eating tobacco drink of liquids contain caffeine leads to bad affect in women's reproductive health. Absence of exercise, increased obesity Affect the pregnancy in women.Taking stress, having under pressure, tension shows bad effects on sexual/ reproductive life of women's. Women's who have these kinds of habits may affect the pregnancy and face early menopause [1].

The human reproduction is sexual reproduction which contain the fertilization of mature male and female gametes by sexual intercourse. During this sexual the interaction between male and female reproductive system occurs. The reproductive system of male and female is different. The male reproductive system involves Testis where the male gamete sperm is produced. Epididymis, vas deference, seminal vesicles, prostate and penis[2].The reproduction system of female contains the outermost part vagina, inside to it cervical canal and cervix there After the uterus where the development of the baby occurs.the fallopian tubes are present on the both sides of the uterus. The fallopian tube contains various parts like isthmus, ampulla, infundibulum and fimbriae. Lastly the ovaries are present on the both sides. The ovary produces egg cells called ova,the female gamete. The ovary releases at least one egg each month possible for the fertilization. During puberty the ovary begins to secrete increasing levels of hormones. Inside the ovaries,egg cells which are developing, gets mature in follicles which are fluid filled[3].generally the only single oocyte is developed at a time, but other can also mature simultaneously. There are various follicles are present in which the eggs are formed. When the oocyte is completely matured,the surge of LH secreted by pituitary gland,it stimulates the oocyte released by rupturing the follicle and it is referred as ovulation. The oocyte is transferred via fallopian tube to the uterus where it gets implanted after fertilized with sperm[4].

Generally, every woman has ovary on the both sides of the uterus.bt in some cases the women have single ovary that implies the absence of ovary since birth in the female body and the other possibility is oophorectomyi.e., removal of ovaries due to some pathological reseasons.it is also referred as ovariectomy.it is a surgical procedure of removing one or two ovaries. This surgery usually performed in cases such as endometriosis, PCOS,tumor etc. related to ovary it has two types.unilateral oophorectomy that is removal of single ovary and bilateral oophorectomy, removal of both the ovaries.this absence of ovary since birth that is congenital is extremely rare condition with one in every 11,240 people get affected [5].

Congenital absence of ovary may decrease the chances of become pregnant however there, having pregnancy is still possible if there is other ovary is in well function. Also, the patients with oophorectomy have increased risk of infertility. The absence or oophorectomy can be diagnosed by the pelvic exam by the gynecologist.Using the ultrasound of abdominal and pelvic region. Laparoscopy of the pelvic part. Biopsy of the tissues and cells. CT scan and MRI scan of the pelvic region[6].In non-human primates it is stated that the process of ovulation happens in equal frequencies in both sided ovaries. While in case of human beings, some studies states that in voluntarily ovulating women the egg releasing process occurs in case of sided ovary is 64% compared to left sided i.e 36%.The length of the follicular phase was discovered to be connected to the side of ovulation[7]. Currently the infertility rate among the Indian population is 10 to 14% which is higher in urban areas where 1 out of 6 couples are affected. The Life of women is not completed just after the marriage, but after the marriage and giving birth to the baby.The society and family respects her only after Reproduction.Menarche is the name given to the first menstrual period which occurs between age of 11 to 14. However, it can happen at any age from 9 to 15.Menopause refers to the end of the cycle of menstruation. It is identified when a woman has gone without a menstrual cycle for 12 months. It can happen in age of 40s or 50s[8]. Some studies showed that the ladies who lost her ovary at less age [prior to 35] has chances of having menopause earlier.

The research study which is carried out in animals like mice,cats, rabbits, pigs on natural cycle showed hypertrophy of ovary and compensatory rate of ovulation after the removal of single ovary. In some previous studies it has shown that in mice, when a single ovary is taken out the other undergoes the hypertrophy so that it's overall weight becomes same as two undetached ovaries. In later study,it was shown that the mice which mated next day after the single oophorectomy had decreased the rate of implantation and ovarian weight. When mating was done more than the next day of surgery, ovarian weight and implantation rate increased, peaking at 19-21 days. Even if the mice get pregnant these data confirmed quick compensation of single ovary. It was suggested that the hypertrophy was caused due to the raised secretion of pituitary gonadotropin [9].

Etiology of single ovary- Absence of ovary from birth is very rare event with fallopian tube attached or not. This also refers as congenital absence of ovary. It is caused due to the basic two reasons. The initial reason is the ovary is

attached to the posterior surface of the broad ligament of uterus by mesovarium.it is parasitic to structures of rest of the intra-abdominal and the omentum.it is distinct from its other attachments is encountered.Well this condition occurs due to torsion of the ovarian pedicle [adnexas] which can caused asymptomatically before the birth or childhood life or adult life. Alternatively, another reason might be attributed to either to a fault in maturation and growth of the complete mullerian and on one side the mesonephric systemor to a fault
localized to the areal part of the genital ridge and the Mullerianducts caudal part. Typically, abnormalities include organs that arise from the mullerian duct.in the sixth week of pregnancy,the bilateral mullerian ducts migrate towards the midline,meet, form luminal structures,fuse,and eventually form the uterus and upper one fifth of vagina.themullerian ducts form fallopian tube and the ovary rostrally.amullerian abnormality is caused by a disruption in the migration, fusion, or resorption of these ducts [10].The proper establishment of the urinogential ridge and correct germ cell migration are required for gonadal development. Multiple factors and genes govern these steps, and a unilateral failure at any moment during this process can prohibit ovarian development.

In Some females the ovaries are removed.causes of oophorectomy involves - Endometriosis- it is a condition in which tissue that resembles the uterine lining develops in other parts of the body. These tissues develop up to the ovaries and begin to penetrate them. These tissue patches are known are known as nodules or lesions. Endometriosis has an unknown cause [11].PCOS- poly cystic ovary syndrome [PCOS] is what it's called.Its a hormonal imbalance. The ovaries may accumulate multiple tiny collections of fluid and fail to release them on a regular basis. On the ovary, several cysts arise.excess insulin, low grade inflammation, inheritance and excess androgen are the cause of PCOS[12]. Ovarian Abscess- Tube ovarian abscess is one of the late complications of pelvic inflammatory illness, and if the abscess ruptures and causes sepsis it can be fatal. It's made up of pus-filled pocket that's been encased. It's an inflammatory mass that affect the fallopian tube, ovary and sometimes the uterus [13].Ovarian Tumor- ovarian cancer is abnormal development of cells in the ovaries. The cells reproduce rapidly and have the ability to infiltrate and kill healthy body tissues. When ovarian cancer first appears,it may not cause any symptoms at all.it starts when the DNA of cell in or near the ovaries changes. Epithelial Ovarian cancer,stromal tumors, and germ layer tumors are all kinds of ovarian cancer[14].To lower the risk of ectopic pregnancy- a total salpingography is performed if the fallopian tube is severely damaged,the ectopic pregnancy is hugeor the lady bleeding profusely. When an ectopic pregnancy involves the ovary, piece or the entire ovary may be removed[15].Pelvic inflammatory disease-PID is sexually transmitted infection that affects women's reproductive organs. Sexually transmitted germs spread from the vaginal area to the uterus, fallopian tube and ovaries.PID can be caused by a variety of bacteria, although gonorrhoea and chlamydia infections are the most prevalent[16].Torsion of ovary- It is an uncommon but serious condition called ovarian torsion occurs when the ovary and sometimes the fallopian tube twist on the tissue that support them. This cut off the blood supply to ovary, which if not treated properly can cause tissue in the organ to die [17].Most of the authors have hypothesized that the unilateral adnexal absence does not diminish female fertility, until there is no abnormality in uterus[18].Removing the source of estrogen which stimulate some Cancer such as breast cancer.Females who had removed the ovary has to seek ART procedures for their infertility treatment. ART is assisted reproductive Techniques contain various procedures which help the patients to have their own child. Like IUI,IVF,ICSI etc. Women with the removal of single ovary produce less oocytes even if the higher and longer doses of stimulation is given. Females with ovariectomy in younger life may have chances that they will respond well to art treatments. Having single ovary shows the significantly lower pregnancy outcome [19].

Various levels Hormones- AMH- Anti Mullerian hormone[AMH] is substances produced by granulosa cells in ovarian follicles. Higher the level more number of follicles expected to have.AMH testing is typically used as an indicator of egg count.it is useful to check the woman's ovarian reserve. Higher the AMH i.e greater than 1ng/ml displays that the women has normal ovarian reserve and lower no i.e less than 1ng/ml displays women with diminished ovarian reserve[20]. The normal values of AMH are – It is high when it is over 4.0 ng/ml, especially in case of PCOS. Normal range is between 1.5 to 4.0 ng/ml. Low Normal range between 1.0 to 1.5 ng/ml. Low value of 0.5 to 1.0 ng/ml. Very low value is less than 0.5 ng/ml. Some studies suggest that the women who have single ovary have

decreased ovarian reserve.it is because in the ovary there is reduced total number primordial follicles and not because of the decreased quality of oocyte [21].

Estradiol-Estradiol has various functions in body of female. Important function of it is to mature and maintain the function of reproductive system. During periods raised estradiol cause the maturation and release of egg.Females with ovariectomy may have dropped level of estradiol and might face early menopause[22]. FSH-follicular stimulating hormone. The serum FSH Concentration is now the best indicator of ovarian reserve.FSH concentrations are likely to be higher in women with single ovary, indicating a depleted ovarian reserve. The diversity in response to Ovarian stimulation for pregnancy and delivery rate vanishes if the level of FSH is controlled [23].Due to the ovariectomy of a single ovary cause the reduction in the ovarian reserve i.e lower the AMH level in blood.women who underwent removal of ovary may need to do hurry for babies because they have less ovarian reserve. The estrogen and progesterone level drops after the oophorectomy which causes the bone disorders,also it affects the uterine lining during menstruation for implantation of foetus. The level of androstenedione gets reduced in patients with single ovary compare to the two-ovary patient's[24].Removal of ovary may raise the chances of having fibroids, the passage of the fallopian tube gets infected after ovary removal cause blocked fallopian tube due to scar tissues, adhesions of the band tissues, leads to the severe infection, accumulation of inflammatory fluid called hydrosalpinx.it is referred as unexplained infertility and for this assisted reproductive Techniques are suggested[25].A study was conducted on the compensatory mechanism in single ovary. There was a one group of lizards in which the large sized ovary was removed while in control group a placebo surgery was performed. Using. the ovine FSH after the surgery both of the group's were stimulated .at the end,the response of the small ovary was remarkably greater in the ovariectomized lizard than in the control. The result reveals a greater sensitivity of the small ovary to FSH if large ovary was absent [26].

CASE REPRESENTATION

This case study refers to a couple who visits Wardha Test Tube Baby Center to treat the infertility. The age of female partner is 31 years and of male partner is 36 years. The couple came to wardha from Chandrapur district, Maharashtra,India.The occupation of male is Teacher and female is housewife. The couple had no habit of consuming liquor and eating tobacco, smoking on daily basis. This case includes the female who underwent the ovariectomy procedure of left ovary and with the follicular cyst on right ovary. They are facing the primary infertility,with the hope of giving birth to a baby from 8 years to 9 years of marriage.

Medical History-The female has removed the ovary of left side and left hydrosalpinx.it, torsion also she has follicular cyst on right ovary. Apart from this the couple had no history of trauma, surgery, hernia, undescended testis. The couple never underwent vasectomy,tubectomy with no any kind of history of sexual disease, medical and mumps history. The couple have no habit drinking, smoking etc.

They had no family history of any of these conditions, such as diabetes, hypertension, tuberculosis, asthma, seizure d isorder, thyroid gland disease, or any other major diseases or surgeries.They had no previous history of psychiatric illness.The couple had taken the treatment at chandrapur district for conception. The patient underwent the Intrauterine insemination treatment twice with a semen analysis procedure of male partner. Both of the IUI attempts failed. Later patient moved to wardha for IVF treatment.

Clinical Findings– The general condition was fair, body temperature is normal. Height of female patient is 5 feet 3 inch. Weight is 60kg. BMI is 23.4. Height of male patient 5feet 6 inch. Weight is 70kg. BMI is 24.9.The couple underwent the treatment of Intrauterine insemination twice. The hysteroscopy of female was done.semen analysis of male partner was done.[uterus Present, anteverted and anti-flexed and tube Connecting uterus is normal with normal Opening].The laparoscopy was done which contain the results of follicular cyst on right ovary and left ovary is absent due to ovariectomy. The couple had undergone the treatment of Intrauterine insemination twice at, Chandrapur. Both

the IUI attempts failed. After through the relatives the couple got to know about the wardha test tube baby center. There after they moved to wardha test Tube Baby Center where they underwent IVF ICSI treatment in 2020.

Female- haemoglobin12.4 mm/deciliter.Total white blood cells count is 8900.Total red blood cells is 5.08 millions/cu.mm. platelets are 3.13 lakhs/cu.mm.E2 [Estradiol]level is 257.08 pg/ml. Kidney Function Test And Liver Function Test isnormal.Thyroid stimulating hormone level is 1.91 uIU/ML.HIV ,HBsAg, HCG-VDRL is Non-Reactive .Anti-Mullerian Hormone [AMH]level is 3.24 .Follicular Stimulating Hormone (FSH) level is 10.46 and Luteinizing Hormone (LH) level is 7.29 .Prolactin level is 32.59. Hysteroscopy reports are Normal. Laparoscopy shows two follicular cyst on right ovary.left ovary is absent.left tube hydrosalpinx and torsion + adhesions. RTPCR is Negative.The diagnosis of female shows The female had 2 follicular cyst on right ovary.left ovary is absent. Left tube hydrosalpinx and torsion dissected.primary infertility with absence of left ovary [oophorectomy].

Male-haemoglobin 15.4 mm/deciliter. Total white blood cells count is 10850.Total red blood cells is 6.02 millions/cu.mm. platelets are 4.15 lakhs/cu.mmKidney Function Test And Liver Function Test is normal.Thyroid stimulating hormone level is 2.41uIU/ML.HIV ,HBsAg, HCG-VDRL is Non-Reactive. Follicular Stimulating Hormone (FSH) level is 10.46 and Luteinizing Hormone (LH) level is 7.29 . RTPCR is Negative. Semen analysis report shows Sperm count is35 mil/ml. Motility Of total Sperm is 60% motile.Sperm morphology is 34%.

Prognosis- Treatment on follicular cyst showed positive results. The quality of the oocyte from the right ovary is good.all the hormonal levels are normal and the semen analysis report of male was good. The IVF, ICSI showed the positive result with husband sperm sample.

Therapeutic Intervention-Treatment has been taken for hydrosalpinx which contain DOXY 100 MG tablet BD for 14 days. Metronidazole Tablet TDS for 14 days.Medication was recommended for 15 days following the embryo transfer [03 day 3 embryos and GRADE A] in which the dose of tab.estradiol was 2 mg QID ['quarter in die'] for 5 days and 2 mg TDS ['ter die'] for 10 days, increasing endometrial thickness.

FOLLOW-UP AND OUTCOMES- This case is of partial ovariectomy in female.The couple of 31 years female and 36 years of male facing primary infertility from last 8 years. They underwent the twice iui treatment which eventually failed due to ovulation was not occurred during iui process. Later In wardha test tube baby Center,IVF[ICSI] is suggested due to partial oophorectomy on left side, the left tube hydrosalpinx and torsion is there. With right ovarian cysts.The semen analysis of male partner was done. The count was 35 mil/ml.with the short antagonist protocol 04 MII ,03MI were retrieved on 21/11/20.04 Day 3 embryos are formed. On 17/02/21 the 03 Day 03 embryos were thawed and transferred. The β-HCG test was done of the Patient, on the 14th day of the embryo transfer she came positive which displays that the implantation is successful [B-HCG =220.75 mIU/ml]four days after the value of B-HCG was raised to 967.6 mIU/ml. Atlast she gave birth to the baby girl in just single cycle of ART.

Follow up is necessaryafter the process of embryo transfer a regular follow up is necessary up to the 14 days. During the each follow up the thickness of the endometrium is checked and observation of the gradually increase in the thickness of endometrium is done which helps to the proper and successful implantation of the Embryo in the uterus. On 14th day the B-HCG test was done which had shown positive result.Out of the 3 transferred embryos only one embryo of good quality was implanted.

DISCUSSION- Even after of having unprotected intercourse of 1 year,still unable to reproduce is called as infertility. Itcan occur in male or female partner[27]. According to WHO, normally there are 15% couples facing infertility all over the world from which the 3.9-16.8% couples are infertile in India. 14% female facing infertility all over the world. Generally, most of the studies show that the women who underwent ovariectomy have 53.9% chances of increased risk of infertility [28].

Some studies suggest that the ovulation from right side ovary is more important for pregnancy. Absence or removal of one ovary causes reduction in estrogen level in blood, progesterone level may causes difficulty to get conceive also leads to bone disorders. Diminished ovarian reserve is one of the cause of removal of ovary due to AMH value gets

affected. Various factors causes the oophorectomy like endometriosis,tumor, torsion,PCOS etc. Removal of ovary can cause the infection or fallopian tube cancer[29-40]. Despite having this if the remaining ovary has proper morphology and in function will not occur any complications for pregnancy. Still in some cases the ovariectomy has may have alternative like increased screening for cancer of ovaries, so that the doctors get early stage diagnosis by regular check-up and tests. Taking frequent birth control pills also affect the ovaries can cause cancer. Avoiding its use may reduce cancer.patients with ovariectomy undergo ART treatments for having own child. ART is procedure of complex series which used to help with fertility or prevent genetic problems. Through the IVF/ICSI procedure chances of successful outcome increases [41-50].

CONCLUSION-

The popularity and the use of ART treatment is increasing day by day. It gives the lifetime happiness and satisfaction to the Patients who suffering from infertility. Especially to the women's who underwent removal of the ovary [ovariectomy] due to the various diseases. Having single ovary already reduces the chances of pregnancy by some percent. The ovarian reserve gets affected. Removal of ovary causes the reduction in the various levels of hormones like estrogen, AMH, progesterone in blood which affect the proper uterine lining during menstruation for implantation due to which the it affects the outcome of getting conceive. Generally the positive outcome depends on the how much functional and morphologically normal the intact ovary is.if any pathology is there to the present ovary via medicines it can be curable. Also, ART also helps to get conceive. Due to oophorectomy in some cases the fallopian tube passage gets blocked due to adhesions, scar tissues, which causes infection, accumulation of water that is hydrosalpinx leads to infertility.it block the way of an egg to travel up to the uterus.This is referred as unexplained infertility. Females who underwent surgery of ovary removal, and having other ovary in proper function [proper ovulation, no blockage in tube] won't affect much the positive outcome of successful pregnancy.To guarantee confidentiality,the Patients information was identified. For ART related process such as what is ivf treatment and how doctors will treat patients.[Therapy plan],risk factors associated with advanced Cancer, pregnancy age, procedure risk. Proper informed consent of patient in taken in local and English language. The author has gathered and saved written ethical approval in accordance with international or university standards[s]. There are no competing interests stated by the author [50].

REFERENCES

1. Homan GF DMNRT impact of lifestyle factors on reproductive performance in the general population and those undergoing infertility treatment: a review. HRUpdate 2007 M 1;13(3):209–23.
2. DJenkins A, Turner TT, Howards SS. Physiology of the Male Reproductive System. Vol. 5, Symposium on Male Infertility Urologic Clinics of North AmeTica. 1978. doi:10.3978/j.issn.2223-4683.2014.02.02
3. Channing CP, Hillensjo T, Schaerf FW. Hormonal control of oocyte meiosis, ovulation and luteinization in mammals. Clin Endocrinol Metab. 1978 Nov;7(3):601-24.DOI: 10.1016/s0300-595x(78)80011-5
4. Hofmeister FJ. Pelvic anatomy of the ureter in relation to surgery performed through the vagina. Clin Obstet Gynecol. 1982 Dec;25(4):821-30. DOI: 10.1097/00003081-198212000-00017
5. DeLancey JO. Structural anatomy of the posterior pelvic compartment as it relates to rectocele. Am J Obstet Gynecol. 1999 Apr;180(4):815-23. DOI: 10.1016/s0002-9378(99)70652-6
6. Erekson EA, Martin DK, Ratner ES. Oophorectomy: The debate between ovarian conservation and elective oophorectomy. Vol. 20, Menopause. 2013. p. 110–4. DOI: 10.1097/gme.0b013e31825a27ab
7. Foti PV, Ognibene N, Spadola S, Caltabiano R, Farina R, Palmucci S, Milone P, Ettorre GC. Non-neoplastic diseases of the fallopian tube: MR imaging with emphasis on diffusion-weighted imaging. Insights Imaging. 2016 Jun;7(3):311-27. DOI: 10.1007/s13244-016-0484-7
8. Adams JM, Taylor AE, Schoenfeld DA, Crowley WF, Hall JE. The midcycle gonadotropin surge in normal women occurs in the face of an unchanging gonadotropin-releasing hormone pulse frequency. J Clin Endocrinol Metab. 1994 Sep;79(3):858-64. DOI: 10.1210/jcem.79.3.7521353
9. Lass A. The fertility potential of women with a single ovary. Vol. 5, Human Reproduction Update. 1999. DOI: 10.1093/humupd/5.5.546
10. Sirisena LAW. Unexplained absence of an ovary and uterine tube. Postgraduate Medical Journal. 1978;54(632):423–4. DOI: 10.1136/pgmj.54.632.423
11. Parasar P, Ozcan P, Terry KL. Endometriosis: Epidemiology, Diagnosis and Clinical Management. Current Obstetrics and Gynecology Reports. 2017 Mar;6(1):34–41. doi: 10.1007/s13669-017-0187-1

12. PCOS Forum: Research in Polycystic Ovary Syndrome Today and Tomorrow Renato Pasquali, ElisabetStener-Victorin, [...], and Richard S. Legro. doi: 10.1111/j.1365-2265.2010.03956.x
13. Chan GMF, Fong YF, Ng KL. Tubo-Ovarian Abscesses: Epidemiology and Predictors for Failed Response to Medical Management in an Asian Population. Infectious Diseases in Obstetrics and Gynecology. 2019;2019. https://doi.org/10.1155/2019/4161394
14. Kashyap P. Ovarian tumor: a review. International Journal of Reproduction, Contraception, Obstetrics and Gynecology. 2021 Aug 26;10(9):3657. DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20213510
15. Wakankar R, Kedar K. Ectopic Pregnancy-A rising Trend. International Journal of Scientific Study [Internet]. 2015; Available from: www.ijss-sn.com.DOI: 10.17354/ijss/2015/340
16. Greydanus DE, Bacopoulou F. Acute pelvic inflammatory disease. Vol. 2, Pediatric Medicine. AME Publishing Company; 2019. doi: 10.21037/pm.2019.07.05
17. Huang C, Hong MK, Ding DC. A review of ovary torsion. Vol. 29, Tzu Chi Medical Journal. Medknow Publications; 2017. p. 143–7. DOI: 10.4103/tcmj.tcmj_55_17
18. DRESLER S. Antenatal Torsion of a Normal Ovary and Fallopian Tube. Archives of Pediatrics & Adolescent Medicine. 1977 Feb 1;131(2):236. doi:10.1001/archpedi.1977.02120150118024
19. Lind T, Holte J, Olofsson JI, Hadziosmanovic N, Gudmundsson J, Nedstrand E, et al. Reduced live-birth rates after IVF/ICSI in women with previous unilateral oophorectomy: results of a multicentre cohort study. Human Reproduction. 2018 Feb 1;33(2):238–47.doi: 10.1093/humrep/dex358.
20. Sun XY, Lan YZ, Liu S, Long XP, Mao XG, Liu L. Relationship Between Anti-Müllerian Hormone and In Vitro Fertilization-Embryo Transfer in Clinical Pregnancy. Frontiers in Endocrinology. 2020 Dec 4;11.doi: 10.3389/fendo.2020.595448
21. Jamil Z, Fatima SS, Ahmed K, Malik R. Anti-Mullerian Hormone: Above and Beyond Conventional Ovarian Reserve Markers. Disease Markers. 2016;2016:1–9. doi: 10.1155/2016/5246217.
22. Gillies GE, McArthur S. Estrogen actions in the brain and the basis for differential action in men and women: A case for sex-specific medicines. Vol. 62, Pharmacological Reviews. 2010. p. 155–98.doi: 10.1124/pr.109.002071.
23. Catteau A, Bach-Ngohou K, Blin J, Barrière P, Fréour T, Masson D. Abnormally Elevated Follicle-Stimulating Hormone (FSH) Level in an Infertile Woman. Case Reports in Endocrinology. 2019 Sep 22;2019:1–5.doi: 10.1155/2019/3071649.
24. Pal L, Torrealday S, Kodaman P. Premature Ovarian Insufficiency - an update on recent advances in understanding and management. Vol. 6, F1000Research. Faculty of 1000 Ltd; 2017. doi: 10.12688/f1000research.11948.1.
25. Yi G, Jee BC, Suh CS, Kim SH. Stimulated intrauterine insemination in women with unilateral tubal occlusion. Clinical and Experimental Reproductive Medicine. 2012 Jun;39(2):68–72. http://dx.doi.org/10.5653/cerm.2012.39.2.68
26. Roth JJ, Jones RE. A single ovary of Anolis carolinensis responds more to exogenous gonadotropin if the contralateral ovary is absent. General and Comparative Endocrinology. 1992 Mar;85(3):486–92.doi: 10.1016/0016-6480(92)90093-y.
27. Lindsay TJ. Evaluation and Treatment of Infertility [Internet]. Vol.91.2015.Availablfrom:www.aafp.org/afp. https://pubmed.ncbi.nlm.nih.gov/25822387/
28. Bhandekar B, More A. A Successful ART Treatment of Advanced Maternal Age Pregnancy with HRT Along with Donor Oocytes: A Case Study at Wardha Test Tube Baby Centre. Journal of Pharmaceutical Research International. 2021 Jul 10;169–75. DOI: 10.9734/jpri/2021/v33i36A31939
29. Deshpande P, Gupta A. Causes and prevalence of factors causing infertility in a public health facility. Journal of Human Reproductive Sciences. 2019 Oct 1;12(4):287–93.doi:10.4103/jhrs.JHRS_140_18
30. Zeinab H, Zohreh S, SamadaeeGelehkolaee K. Lifestyle and Outcomes of Assisted Reproductive Techniques: A Narrative Review. Vol. 7, Global journal of health science. 2015. p. 11–22.doi:10.5539/gjhs.v7n5p11
31. Seth NH, Bele AW, Singh NC, Qureshi MI, Kulkarni CA: A 10 Years Old Child Presented with Hemiparesis and Moyamoya Disease - A Case Report. JOURNAL OF PHARMACEUTICAL RESEARCH INTERNATIONAL. 2021, 33:422–5. 10.9734/JPRI/2021/v33i45A32761
32. Wanjari M, Mendhe D: A 50-year-old female with bullous pemphigoid. PAN AFRICAN MEDICAL JOURNAL. 2021, 39:. 10.11604/pamj.2021.39.281.30739
33. Hiwale KM, Tyagi AK: A Brief Study on Primary Melanoma over Breast Region. JOURNAL OF PHARMACEUTICAL RESEARCH INTERNATIONAL. 2021, 33:86–90. 10.9734/JPRI/2021/v33i40B32267
34. Gandhasiri D V, Dhamgaye TM, Jadhav U, Ghewade B: A Case of Disseminated Extensively Drug Resistant Extrapulmonary Tuberculosis. JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH. 2020, 14:LD1–3. 10.7860/JCDR/2020/44916.14183
35. Rao AR, Taksande A: A Case of Gorlin-Goltz Syndrome Presented With Multiple Odontogenic Keratocysts in the Jaw Without Skin Manifestation. CUREUS JOURNAL OF MEDICAL SCIENCE. 2022, 14:. 10.7759/cureus.24666
36. Khandar J, Sawarkar A, Shambharkar M, Kasturkar P: A Case of Rheumatoid Arthritis Associated with Microcytic Anemia. JOURNAL OF PHARMACEUTICAL RESEARCH INTERNATIONAL. 2021, 33:114–7. 10.9734/JPRI/2021/v33i47A32996
37. Ganapathi K, Ali S, Jadhav U, Ghewade B: A Case of Small Cell Carcinoma of Lung Presenting as Opaque Hemithorax. JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH. 2020, 14:. 10.7860/JCDR/2020/45825.14120
38. Babar TK, Bele AW, Singh NC, Qureshi MI, Kovela RK, Kulkarni CA: A Case Report of Comminuted Patella Fracture with Open Reduction. JOURNAL OF PHARMACEUTICAL RESEARCH INTERNATIONAL. 2021, 33:1–5. 10.9734/JPRI/2021/v33i45B32770
39. Dhobe S, Singh S, Sharma R, Ankar R: A Case Report of Complete Heart Block. JOURNAL OF PHARMACEUTICAL RESEARCH INTERNATIONAL. 2021, 33:546–50. 10.9734/JPRI/2021/v33i46B32974
40. Whole R, Chitale N, Phansopkar P: A Case Report of Plantar Fasciitis in Diabetic Female Successfully Treated with Physical Therapy. BIOSCIENCE BIOTECHNOLOGY RESEARCH COMMUNICATIONS. 2021, 14:113–5. 10.21786/bbrc/14.6.26

41. Wawre S, Dhengare A, Wagh P, Bikade K, Raut A, Gujar S: A Case Report on Acute Transient's Psychotic Disorders. JOURNAL OF PHARMACEUTICAL RESEARCH INTERNATIONAL. 2021, 33:111–6. 10.9734/JPRI/2021/v33i58A34095
42. Singh RK, Parihar PH, Mishra GV, Dhande RP, Patwa PA: A case report on aggressive giant cell tumor of greater trochanter: a divergent site. EGYPTIAN JOURNAL OF RADIOLOGY AND NUCLEAR MEDICINE. 2021, 52:. 10.1186/s43055-021-00598-8
43. Ekhar D, Vanlalpeka S, Sayyad S, Meshram D, Uke T, Gawai J, Kasturkar P: A Case Report on Alcohol Dependence Syndrome with Cannabis Addiction. JOURNAL OF PHARMACEUTICAL RESEARCH INTERNATIONAL. 2021, 33:439–44. 10.9734/JPRI/2021/v33i57B34078
44. Meshram D, Gawai J, Kasturkar P: A Case Report on Alzheimers Dementia. JOURNAL OF PHARMACEUTICAL RESEARCH INTERNATIONAL. 2021, 33:147–52. 10.9734/JPRI/2021/v33i45B32791
45. Karadbhajne P, Tambekar A, Gaidhane A, Syed ZQ, Gaidhane S: A Case Report on Ancylostoma Duodenale Infection in Pregnant Woman. BIOSCIENCE BIOTECHNOLOGY RESEARCH COMMUNICATIONS. 2021, 14:100–3. 10.21786/bbrc/14.6.23
46. Patwa PA, Singh RK, V. Mishra G, V. Phatak S, Dhande RP: A Case Report on Isolated Ancient Ulnar Nerve Schwannomas with a Daughter Lesion. JOURNAL OF KRISHNA INSTITUTE OF MEDICAL SCIENCES UNIVERSITY. 2021, 10:106–10.
47. Madavi S V, Gujar S, Sharma R, et al.: A Case Report on Malignant Ovarian Germ Cell Tumor. JOURNAL OF PHARMACEUTICAL RESEARCH INTERNATIONAL. 2021, 33:43–7. 10.9734/JPRI/2021/v33i54A33717
48. Kannao V, Deshmukh N, Uttamchandani S, Phansopkar P: A Case Report on Proximal Humerus Fracture and Physiotherapy Rehabilitation. BIOSCIENCE BIOTECHNOLOGY RESEARCH COMMUNICATIONS. 2021, 14:120–3. 10.21786/bbrc/14.6.28
49. Selsurkar S: A Case Report on Pulmonary Effusion due to NonHodgkin's Disease. JOURNAL OF PHARMACEUTICAL RESEARCH INTERNATIONAL. 2021, 33:256–60. 10.9734/JPRI/2021/v33i39A32168
50. Bawane S, Mahakalkar M, Ankar R: A case report on Severe Acute Respiratory Infection. JOURNAL OF PHARMACEUTICAL RESEARCH INTERNATIONAL. 2021, 33:206–10. 10.9734/JPRI/2021/v33i57B34047