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GYNAE SPECTRUM

Dear Doctor,
Greetings from Micro Labs. We are happy to bring you "Gynae Spectrum", which contains latest and interesting news in the field of Obstetrics and Gynecology.

This issue contains:

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Best Regards,
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1. A Pilot study of Hemodynamic Assessment of Pregnant women with or without Obesity using Non-invasive Cardiac monitoring (NICOM)

Introduction:

The global obesity epidemic continues unabated, with 300 million females suffering from obesity, according to the most recent estimates. Obesity is characterized as having a BMI of more than 30 kg/m2 in the general population. Obesity can change hemodynamic function by increasing cardiac output (CO) and stroke volume (SV). Obesity is also linked to heart failure and a change in myocardial geometry. Obesity in pregnancy is defined as a BMI of higher than or equal to 30 kg/m2 at the first prenatal visit, and it puts the pregnancy at high risk. Obese pregnant women have a higher risk of prenatal hypertension, preeclampsia, gestational diabetes, maternal death, and caesarean deliveries. Stillbirth, macrosomia, and congenital abnormalities are all devastating consequences for the foetus. Obese babies are more likely to have fetal discomfort in birth, meconium aspiration, and low Apgar's scores, as well as a higher risk of early mortality as adults. [1]

Methods:

This prospective comparative cohort pilot research was carried out on two groups of pregnant women, one with and one without obesity. Persons with obesity were defined by BMI higher than or equal to 30 kg/m2 at the time of initial booking into a local prenatal clinic, whereas people without obesity were identified by BMI 18 to 25 kg/m2. All of the patients that were recruited were at least 18 years old and were tracked throughout their pregnancies. By providing informed permission, all patients consented to participate. The local institutional review board gave their approval to the research. Patients were interviewed, and relevant medical and social information was gathered. At the initial appointment, the patient's height was measured. All recruited patients performed anthropometric measurements and Cardiovascular Measurements once every trimester (12–14, 21–23, and 34–36 weeks). NICOM (non-invasive cardiac output monitoring) was utilized to identify hemodynamic differences between obese and non-obese pregnant women during pregnancy.

Result:

Obese pregnant women exhibited greater blood pressure, stroke volume (SV), TPRI, and cardiac output (CO) during the first trimester. In the second and third trimesters, pregnant women with obesity had higher SV and cardiac indexes. BMI had a favourable relationship with SV, TPRI, and CO throughout the first trimester. TPRI and fat mass were shown to have a substantial link. During the second trimester, BMI was linked to CO, and fat mass was also linked to CO. TPR has been linked adversely with BMI and fat mass throughout the third trimester. Correlation analysis showed that the change in fat mass over the course of pregnancy significantly correlated with changes in TPR is shown in Fig 1 and Fig. 2.

Discussion:

The goal of this study was to use NICOM to characterise hemodynamic parameters in persons with obesity and normal weight during pregnancy and to track pregnancy outcomes. During pregnancy, this tiny pilot research discovered significant cardiovascular disparities in pregnant women with and without obesity. Because of the short sample size, it was not possible to link these hemodynamic alterations to maternal and foetal outcomes. Obese people have a larger circulation blood volume and a larger stroke volume due to their greater levels of adiposity.

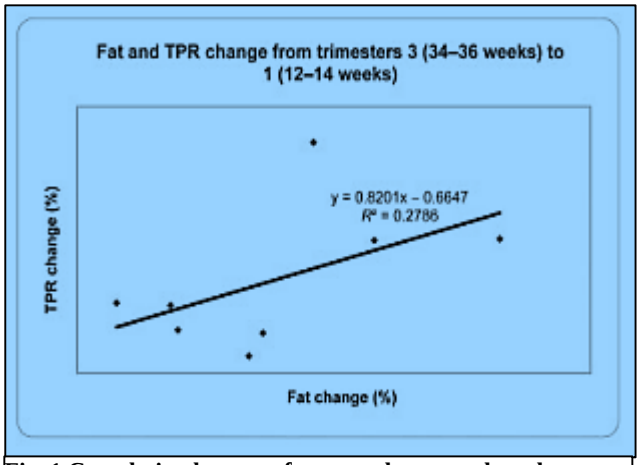

Fig. 1 Correlation between fat mass change and total peripheral

A greater resting heart rate is also a possibility. Obese people have a greater CO than age- and sex-matched normal weight people because CO is the product of SV and heart rate. This compensatory strategy can damage the myocardium over time, producing ventricular enlargement and hypertrophy in the left and right ventricles. Chamber dilation, if left untreated, can lead to diastolic and systolic ventricular dysfunction, which can lead to overt heart failure in extreme cases. [2]

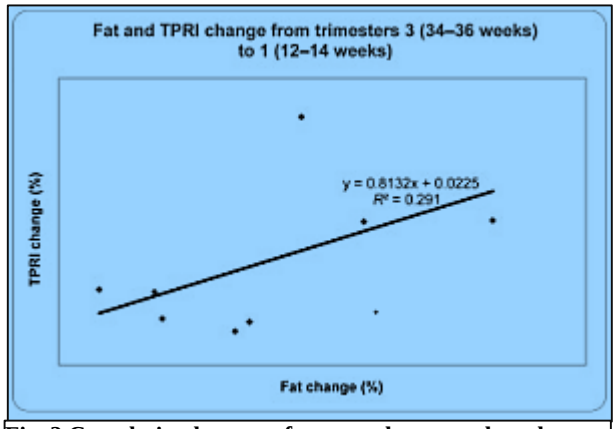

Fig. 2 Correlation between fat mass change and total peripheral

Stroke Volume (SV) levels in this study's subjects dropped steadily during pregnancy. The difference between end-diastolic volume (EDV) and end-systolic volume (ESV) is physiologically known as SV (SV= EDV - ESV). There were no clinical symptoms of heart failure in any of the research participants, suggesting that ventricular systolic function was still acceptable. The drop in SV might be linked to moderate ventricular diastolic dysfunction.

The majority of the hemodynamic and anthropometric alterations seen in the study group happened between the first and second trimesters, which is worth noting. According to epidemiological research, gaining weight between pregnancies was linked to an increased risk of fetal malformation. The weight increase during pregnancy has also been linked to a poor outcome for both the mother and the baby. [3] Although the current study's numbers are

insufficient to draw firm conclusions, it was speculated that fat mass gain between the first and second trimesters, combined with the hemodynamic changes already present due to obesity and pregnancy, may have resulted in some degree of left ventricular diastolic dysfunction and thus lower SV.

Conclusion:

The cardiac output (CO) and cardiac index (CI) of the obese participants in this research were constant. This might be due to the fact that people are still young and can compensate with faster heart rates. Extrapolating from this, for persons who are obese at the beginning of their journey, more targeted fat mass control between the third and fourth trimesters of pregnancy, Better hemodynamic function in the first and second trimesters might help to mitigate the increased TPR and lower CO/CI. The purpose of this pilot research was to see how effective it was in the clinic in obese and non-obese pregnant women, NICOM was found. It was an interesting experience. It was feasible to determine that NICOM was effective in measuring cardiovascular and hemodynamic changes over time gestation. Additional research, such as echocardiography, is being conducted to confirm these findings, evaluations are required.

- **Obesity is still a major health problem in today's world, and obesity during pregnancy has substantial consequences for patients' and mothers' cardiovascular health.**

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2. Fertility Preservation by Progestin-Primed Ovarian Stimulation

Introduction:

In recent years, progestin-primed ovarian stimulation (PPOS) has been employed in infertile patients, and various papers have reported that the oocyte collection outcomes are similar to those of the GnRH-ant regimen. Random-start ovarian stimulation is often recommended for emergency fertility preservation. As a result, in fertility-preserving instances, we compared the clinical results of random-start PPOS with those of traditional random-start GnRH-ant procedures. [1]

Methods:

This retrospective study looked at 86 rounds of oocyte harvest at a hospital for fertility preservation. Breast cancer accounted for 73% of the cases, with hematological diseases accounting for 15%. Oocyte and/or embryo cryopreservation were provided to patients who had male companions, either legally married or not. Only oocyte cryopreservation was available to patients who did not have male companions. In couples who had never become pregnant before, sperm analysis for male partners was always done before oocyte harvest. There was no significant male infertility in the subjects in this investigation. The number of days of stimulation, total gonadotropin dosage, serum E2 concentrations on ovulation trigger day, oocyte maturation rate, fertilization rate in cases of embryo freezing, and excellent blastocyst rate was the objectives.

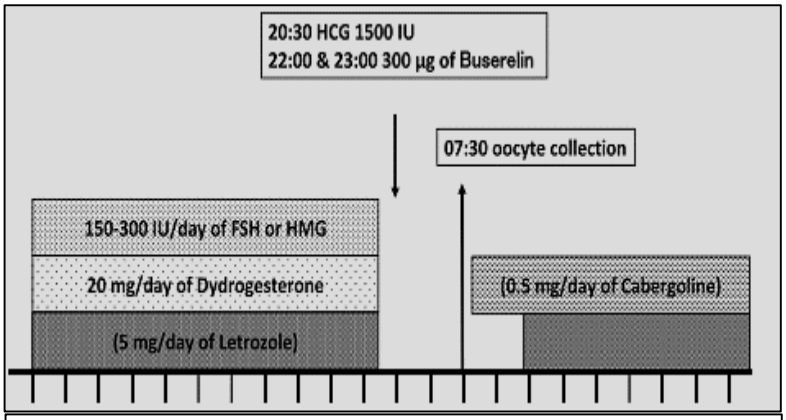

Fig. 1 Random-start progestin-primed ovarian stimulation regimens

If oocyte collection was requested following counselling, ovarian stimulation was started right away, independent of the menstrual cycle, for referred fertility-preserving patients. Depending on the practice of the attending doctors and the patient's selection for ovarian stimulation strategy, a random-start PPOS or GnRH-ant regimen was adopted. Subcutaneous injections of recombinant FSH were used to start both techniques. All of the patients with breast cancer were referred to the institution with information about their estrogen receptor status, which had been checked either on a biopsy sample or a surgical specimen. n. From the commencement of ovarian stimulation until the day of trigger, 5mg/day of letrozole was utilized in conjunction for estrogen receptor-positive breast cancer patients.

A flexible technique was used in the GnRH-ant group, in which 0.25mg of ganirelix acetate was given daily starting the day the primary follicle diameter reached 14mm by ovarian stimulation. The average of the main and minor axes was used to determine follicular diameter. From the commencement of ovarian stimulation to the day of trigger, the PPOS group received 20mg of dydrogesterone every day. Every 2–5 days, blood levels of FSH, LH, E2, and progesterone (P4), as well as transvaginal ultrasonography, were used to assess follicular expansion in both groups. The stimulation regimens are shown in Fig.1.

	GnRH-ant, $n=56$ (Letrozole combination, $n=38$)	PPOS, $n=30$ (Letrozole combination, $n=18$)	*P* value
HMG dose	2527.6 (73.3)	2512.9 (100.2)	0.905
HMG duration, days	11.0 (0.3)	11.2 (0.4)	0.616
Number of collected oocytes	9.9 (0.9)	12.2 (1.2)	0.137
Number of mature oocytes	8.4 (0.8)	10.8 (1.1)	0.099
Maturation rate, %	84.1 (2.4)	89.5 (3.3)	0.195
Number of visits for monitoring	4.2 (0.1)	3.4 (0.14)	**< 0.001***
Start of menstruation before oocyte collection, %	25.0	3.3	**0.013***

Fig.2 Comparison of oocyte collection results

After oocyte harvest, patients with male partners who choose embryo cryopreservation performed intracytoplasmic sperm injection (ICSI), in vitro fertilisation (IVF), or split insemination. ICSI was aggressively suggested in instances with low semen findings on the day of oocyte harvest, despite the fact that selection was based mostly on the patient's wish. There were no cases of severe male infertility in this investigation.

The retrieved eggs were pipetted to remove the granulosa cell layer attached to a piezo-electric actuator on day 0 of oocyte retrieval. The cells were cultivated using a single-step culture medium after being injected with sperm. On days 1, 2, 3, 5, and 6, after egg extraction, embryos were monitored in the time-lapse culture system. On the first day following oocyte extraction, two pronuclei were identified, indicating normal fertilisation. The final sperm concentration was adjusted to 300,000/mL within 2 hours of oocyte harvest, and insemination was conducted. When the granulosa cell layer was removed, fertilisation was determined, and the second polar body was confirmed around 5 hours later.

	GnRH-ant $n=37$ (Letrozole combination, $n=27$)	PPOS, $n=16$ (Letrozole combination, $n=10$)	*P* value
HMG dose	2552.7 (97.3)	2438.2 (148.1)	0.521
HMG duration, days	11.1 (0.3)	10.9 (0.5)	0.658
Number of collected oocytes	9.8 (1.0)	10.3 (1.5)	0.779
Maturation rate, %	89.0 (2.4)	90.1 (3.7)	0.807
ICSI rate, %	78.4	87.5	0.704
Fertilization rate, %	67.9 (4.0)	64.6 (6.1)	0.655
Number of frozen blastocysts	2.8 (0.5)	2.3 (0.7)	0.551
Good blastocyst rate, %	59.8 (5.4)	61.3 (8.1)	0.872

Fig. 3 Comparison of frozen embryo cases

The number of oocytes and metaphase two oocytes per cycle were the major outcomes. The number of vitrifed blastocysts each cycle in embryo freezing instances was a secondary result. AMH levels, ovarian stimulation time, total dosage of gonadotropin preparation, days in the hospital, start of menstruation rate before oocyte collection, number of collected oocytes, number of mature oocytes, and number of normal fertilised oocytes were also compared.

Results:

The number of days of stimulation, total dose of gonadotropin preparation, and the number of

developed oocytes and vitrifed blastocysts showed no significant differences. The PPOS group had a significantly decreased number of hospital visits for monitoring. The PPOS group had much less menstruation prior to oocyte harvest. The comparison of the oocyte collection and frozen embryos are shown in Fig. 2 and Fig. 3.

Discussion:

This is the first study to demonstrate the utility of random-start PPOS in fertility-preserving situations. There was no difference in oocyte collection outcomes between the random-start GnRH-ant and PPOS techniques, according to the findings. Furthermore, because progestin was constantly supplied in PPOS, compared to the random-start GnRH-ant technique, random-start PPOS significantly prevented the onset of menstruation before oocyte harvest. Although uterine bleeding can be a big issue in hematological condition patients with thrombocytopenia, it may be an advantage of random-start PPOS since the presence of menstruation does not concern patients and caregivers during ovarian stimulation and oocyte collection. [2] It is sufficient to begin monitoring one week following the commencement of PPOS, however, monitoring in the GnRH-ant protocol should begin sooner and be more frequent in order to prepare for an unexpected LH spike. Thus PPOS has the potential to alleviate patient stress while also gaining a cost-effectiveness benefit because of progestins' cheap cost.

The impact of progesterone on the quality of oocytes has also been studied. 238 patients that underwent the freeze-all technique were separated into two groups based on P4 concentrations at the moment of trigger (1.5ng/mL and 1.5ng/mL) in the random-start GnRH-ant method. In terms of embryonic aneuploidy, there were no significant differences. [3] The most prevalent disease for which assisted reproductive technology is used to preserve fertility is breast cancer. To avoid a rise in serum E2 concentrations, letrozole, an aromatase inhibitor, is recommended for hormone-dependent cancers. [4]

- **In terms of oocyte collection results, random-start PPOS and GnRH-ant were similar. PPOS can help patients feel less stressed by minimizing the number of times they have to go to the hospital. Taking PPOS at the start of the luteal phase can stop menstruation from starting during ovarian stimulation.**

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3. Clinical Management and Outcomes of Untreated and Treated Chronic Hepatitis B in Pregnant patients.

Introduction:

Correct care of chronic hepatitis B (CHB) during pregnancy, as well as the deployment of vertical transmission prevention techniques, are critical steps in lowering the worldwide burden of CHB. The combination of active and passive vaccination of the infant is used to prevent mother-to-child transmission (MTCT). Being the offspring of a hepatitis B e antigen-positive and highly viremic mother is the greatest risk factor for MTCT despite immunoprophylaxis. [1] With an HBV DNA level of >200 000 IU/mL (i.e. 1 million copies/mL), antiviral therapy is recommended in pregnant women. Antiviral medication should be begun around 28-32 weeks of pregnancy and continued for up to 12 weeks following birth, according to recommendations. [2]

Methods:

The implementation of vertical transmission prevention techniques is a critical step in lowering the worldwide burden of chronic hepatitis B. This prospective research was designed to look at the clinical course and consequences of untreated and treated HBV in pregnant women.

HBsAg-positive pregnants were recruited prospectively, and antiviral medication was given to those who were eligible. The pregnancy and neonatal outcomes of the treated (n=29) and untreated (n=136) groups were studied. Infants were given active-passive immunoprophylaxis and had their HBsAg levels checked.

Results:

The treated group had considerably greater risk factors for transmission (HBeAg positivity, previous birth of an HBsAg-positive child). The virus had been suppressed enough in all of the subjects who were receiving therapy. Increased viral load was seen in half of the pregnant women who did not get therapy throughout the postpartum period. Even though there were no significant differences in other biochemical indicators, the treatment group had considerably greater pre- and postpartum alanine aminotransferase levels than the untreated group. Between the two groups, there were no significant changes in fetal outcomes. At seven months postpartum, all of the babies were HBsAg-negative. Fig. 1 summarises the clinical follow up of pregnant women in this study.

Discussion:

The prevention of MTCT and management of CHB during pregnancy are critical precautions in lowering the worldwide burden of CHB. The goal of this study was to monitor the clinical course and characteristics of untreated and treated chronic Hepatitis B in pregnant women, as well as to investigate the differences between the two groups in terms of laboratory values and neonatal characteristics.

Because of the thorough monitoring and control in this trial, no MTCT occurred. According to several research, if perinatal transmission occurred in a previous pregnancy, the risk of MTCT in this pregnancy is likely to be increased. [3] In addition, new research suggests that mothers with a history of HBsAg-positive children should begin antiviral medication regardless of HBV

DNA levels. The history of previous HbsAg-positive kid ratio was considerably greater in the treated group, despite the fact that this was not considered a therapeutic indication in the study. As a result, for MTCT, a greater attention should be paid to this group.

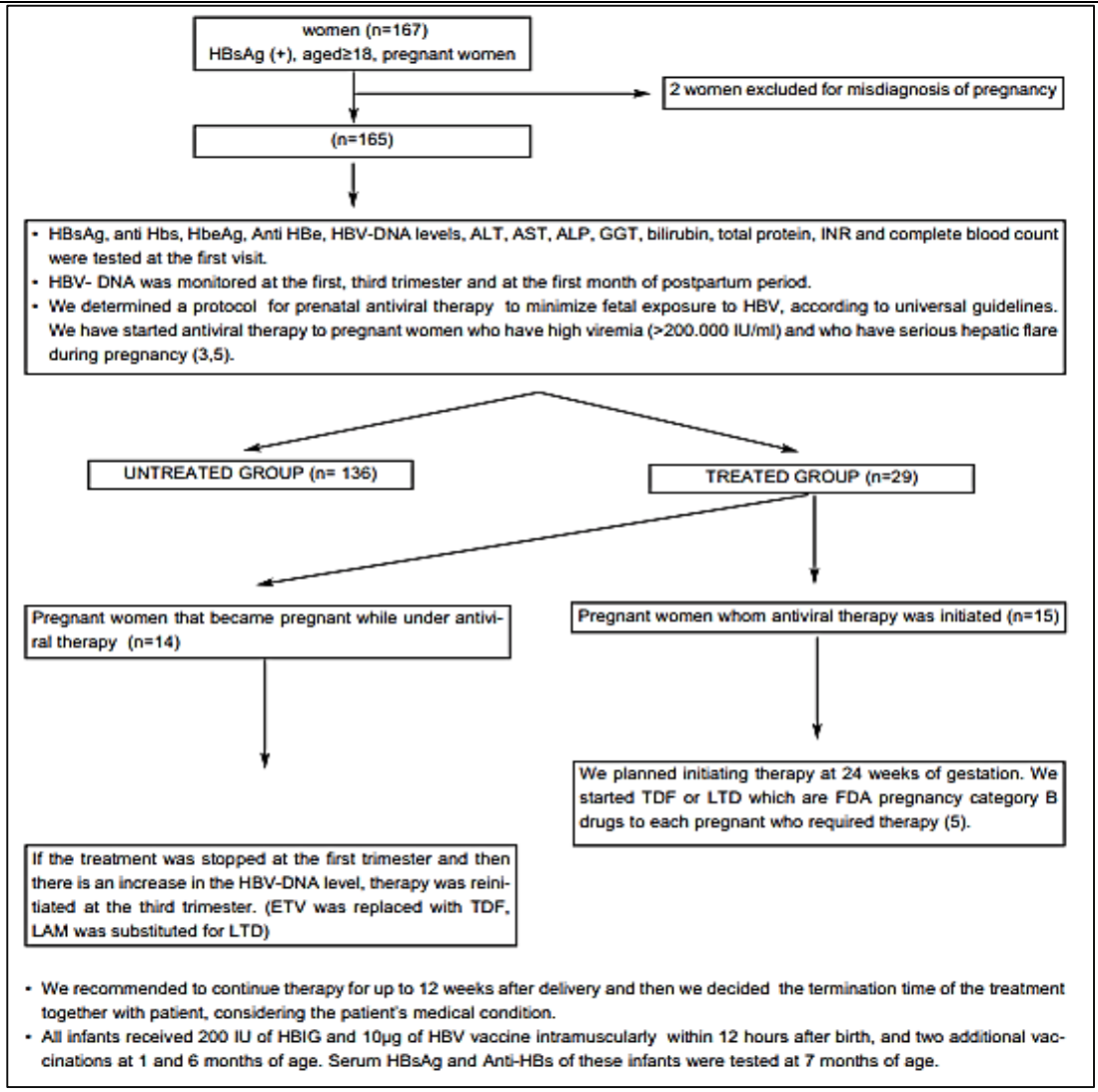

Fig. 1 Clinical follow-up of pregnant women

Except for ALT levels, there were no significant changes between the treated and untreated groups in terms of biochemical markers in this investigation. Pre- and postpartum ALT levels in the treatment group were significantly higher than in the control group. Postnatal ALT levels were substantially greater than prenatal ALT levels in the untreated group. Similarly, serum ALT levels were considerably greater in HBV carriers than in the control group in research. [4] The liver histology will deteriorate in the postpartum period, even in the inactive carriers' group.

Antiviral medication should be begun between 24-28 weeks of pregnancy to prevent MTCT, according to global standards, and followed those recommendations when deciding when to start treatment. TDF was chosen as the first line of defence due to its antiviral efficacy and research demonstrating its safety during pregnancy. TDF lowered the rate of MTCT without

increasing the risk of adverse responses or unfavourable maternal or fetal outcomes, according to a meta-analysis. [5]

Conclusion:

Since no one in the study had liver cirrhosis, the decision to continue the medication was made jointly by both parents, taking into account the health of the pregnant woman and the fetus. Antiviral medication was usually avoided throughout the first trimester. In one research, eight out of twelve individuals (66.7%) experienced a viral comeback after quitting antiviral medicines during pregnancy, and six patients (50%) experienced severe hepatitis flares. Pregnant women with high pretreatment ALT levels or who were treated less than a year before pregnancy had a higher risk of hepatic flares, according to one study. In the investigation, there were no hepatic flares in this group, and the viral rebound ratio was also lower than in the previous study (25%).

While inactive carriers were found in the untreated group, the treated group had a higher likelihood of perinatal transmission. Despite the fact that antiviral medication can significantly lower viral load, most pregnant women who were not given treatment had higher levels of HBV DNA. The postpartum hepatic flare was also uncommon, although it happened in both the treated and untreated groups. It was concluded that antiviral medication had no negative impact on baby outcomes as compared to the untreated group.

- **it was possible to successfully avoid MTCT in babies by initiating antiviral medication as needed, closely monitoring patients, and providing active and passive immunoprophylaxis.**

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4. A case report of spontaneous unilateral ovulation resulting in simultaneous bilateral fallopian tubal pregnancy.

Introduction:

Ectopic pregnancy is one of the most common acute abdominal disorders in gynaecology and obstetrics, with a 1-percentage-point incidence and rising frequency. It's the most common cause of maternal mortality, especially in the first trimester. The most frequent form of ectopic pregnancy is a fallopian tube ectopic pregnancy, which accounts for 90–95 percent of all ectopic pregnancies. [1] While unilateral tubal ectopic pregnancy is common, bilateral simultaneous fallopian tubal pregnancy is uncommon, with a reported incidence of 5 in 1 million deliveries. Bilateral simultaneous fallopian tubal pregnancy is more common in patients who have used Assisted Reproductive Techniques (ARTs) or who have had ovulation induction. [2]

Case Report:

A 27-year-old Asian woman came to the hospital with a 37-day history of amenorrhoea and two days of vaginal spotting. The woman had a normal menstrual cycle and had no previous pelvic surgery, nor had she undergone any infertility therapy, contraception, or pelvic inflammatory illness (PID). Her vitals were normal at the time of presentation, with a consistent heart rate of 77 beats per minute and a blood pressure of 120/84 mmHg. Aside from a minor vaginal bleeding and soreness in the bilateral adnexal region, a gynaecological examination revealed no abnormalities. A blood test indicated a beta human chorionic gonadotropin (-hCG) concentration of 2974.00 mIU/mL. The pelvic transvaginal ultrasound examination revealed a normal uterus in the anterior position (56 mm*43 mm*52 mm), a 10 mm thick endometrium with no gestational sac, and a uniform posterior uterus wall. Fullness was detected in the Douglas Pouch with an anechoic area of 35 mm*13 mm and ovary sizes of 33 mm*25 mm and 30 mm*20 mm, respectively.

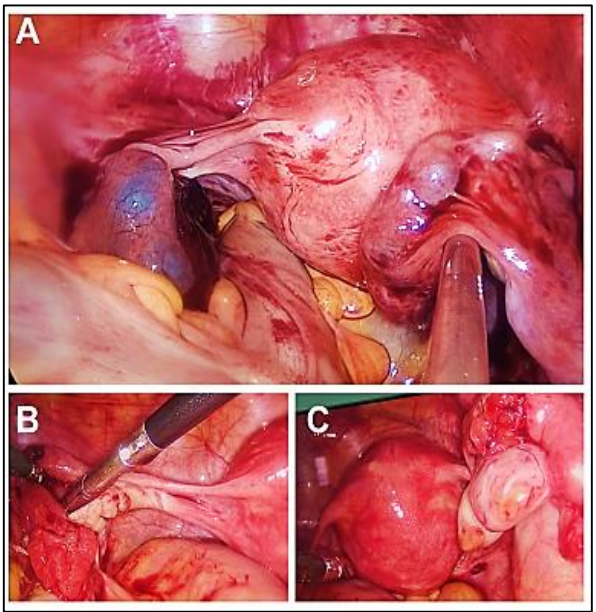

Fig. 1 Intraoperatively laparoscopic examination A revealed a bilateral fallopian tube pregnancy, B no corpus luteum was visualized in the left ovary, and C two corpus luteum were visualized in the right ovary after ovulation

The patient was admitted for dynamic blood -hCG monitoring and other examinations due to the patient's reproductive needs. Serological tests, including dynamic blood -hCG, were requested upon admission in the afternoon, and the patient was scheduled for surgical intervention the next day. Serological tests the next day revealed a blood -hCG level of 3091.00 mIU/mL, a progesterone level of 36.5 nmol/L, and no significant rise in blood hCG compared to the outpatient clinic result. The symptoms, blood-

hCG titer, and pelvic transvaginal ultrasound test results all point to a "ectopic pregnancy."

An enlarged and entire left fallopian tube ampulla (4*3*3 cm) was discovered intra-operatively, with haemorrhage blocks at the umbrella end. The right fallopian tubes ampulla (3*22*22 cm) was enlarged.

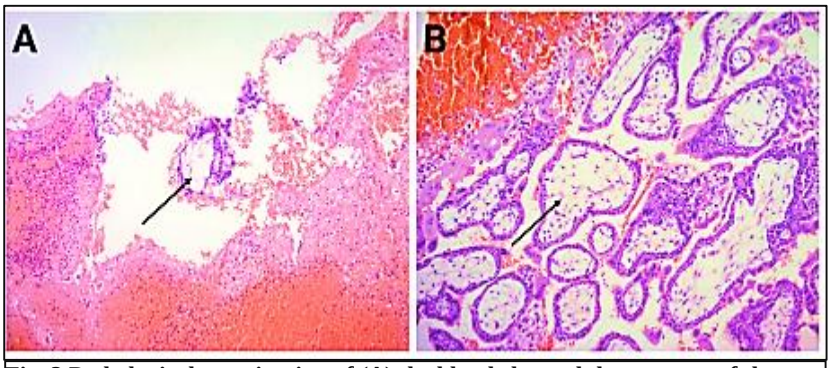

Fig. 2 Pathological examination of (A) the blood clot and the contents of the right fallopian tube, (B) the blood clot and the contents of the left fallopian tube, and the black arrows indicate the chorionic villi tissues

The right ovary, on the other hand, was normal in size but had two corpus luteum, indicating that it had had a double spontaneous unilateral ovulation (Fig.1). In the left ovary, there were no abnormalities. Following the signatures of family members, bilateral fallopian tube fenestration and embryo extraction were carried out. Hematocele and chorionic villi tissues were discovered following dissection after the embryo was removed from both fallopian tubes. To prevent conception, 50 mg Methotrexate (MTX) was injected into the bilateral fallopian tube mesangium and fenestrated fallopian tubes.

The existence of chorionic villi tissues in the blood clot and the contents of both the left and right fallopian tubes was shown by pathological investigation (Fig. 2). Nutritional support treatment was given postoperatively to aid recovery. Two and four days after surgery, serological testing revealed blood -hCG levels of 768.99 mIU/mL and 254.61 mIU/mL, respectively. The patient's vital signs were stable, so she was discharged. The patient was followed for a month in outpatient clinics until his blood -hCG level was normal.

Discussion:

Ectopic pregnancy is a frequent gynaecological condition caused by physically defective fallopian tubes, fertilised egg migration, contraception failure, and assisted reproductive technology adoption. The likelihood of multiple gestations in a natural state is calculated using Hellin-law, Zeleny's which is $1/89^{n-1}$ where n is the number of foetuses in a single pregnancy. According to the calculation, the chance of having twins in a natural condition is around 1%; dizygotic twins account for about 70% of pregnancies, while monozygotic twins account for about 30%. Although spontaneous twins can result from unilateral or bilateral ovulation, no statistical study has ever been published. [3]

The patient in this case had no history of ART-assisted reproduction, no dysmorphic uterus, and no familial history of ART-assisted reproduction. During laparoscopy, the patient had a spontaneous bilateral tubal pregnancy with no evidence of ovulation in the left ovary. After ovulation, there were two corpus luteum visible in the right ovary. Ectopic pregnancy induced by the successful delivery of two eggs from the right ovary to either side of the fallopian tube is extremely uncommon. It would be more accurate to identify whether the present pregnancy was dizygotic or monozygotic twins if the chorionic villi tissues of bilateral ectopic pregnancy could be genetically discovered.

Conclusion:

The effective management of bilateral tubal pregnancy demonstrates that during a laparoscopy examination and/or operation, a thorough assessment of both tubes is required, even if there are no tears or blood clots at the umbrella end, to prevent missing this uncommon life-threatening disease. Preoperative ultrasound evaluation and careful scrutiny during laparoscopic inspection of the whole pelvic cavity are required to rule out bilateral tubal pregnancy.

- **Preoperative ultrasound evaluation and careful scrutiny during laparoscopic inspection of the whole pelvic cavity are required to rule out bilateral tubal pregnancy.**

References:

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