Volume 23, February 2024, Issue 9

AOGD BULLETIN

Holistic Approach to Women's Health

AOGD 2023

Recurrent Pregnancy loss
Hysteroscopy

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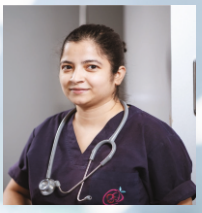

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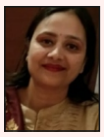

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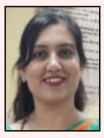

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From the AOGD Office


Dr Amita Suneja


Dr Abha Sharma


Dr A G Radhika

Dear Friends

The month of January 2024 flew by, but not without fanfare! Now, the FOGSI landscape is dotted with key posts held by AOGD members. Among the highlights is the appointment of Dr. Neerja Bhatla as fogsi Vice President, North Zone and Dr Ashok Kumar as vice-president elect ICOG. In addition, our members have won several awards, which are listed in the bulletin's awards section.

The current issue of the journal on 'Recurrent pregnancy loss and Hysteroscopy' contains important updates on both topics.

A very important event is coming up on 28th March 2024. Our plans call for a brief programme of felicitations, the introduction of new office bearers with handover of AOGD office, followed by a General Body Meeting. Important information regarding the AOGD activities would be shared with all.

We look forward to meeting you all in person. Please make time to attend.

Let the days of beautiful sunshine & blooming gardens in the days ahead, fill your heart with joy!

Cheers!

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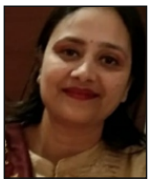

Dr Anupama

Co-Editor

Respected seniors and dear friends

Greetings of Vasant Panchmi to all!

The theme of this month's bulletin is recurrent pregnancy loss and hysteroscopy. The issue contains an algorithm on evaluation of RPL, mullerian anomalies and reproductive surgeries in RPL.Topics like evaluating the unexplained stillbirths gives us a road map and insights for the critical issue, essential practice guidelines for Rh – isoimmunised pregnancy .

With the advent of endoscopy era there is focus on role of hysteroscopy in infertility and keeping in mind the associated medicolegal issues an article on ensuring the safety of patients in hysteroscopy is much needed discussion. A snapshot on hysteroscopic septal resection along with the video link is a must watch for readers. There is also an article on impact of impact factor, the most discussed bibliographic indicator in research so far.

Happy reading!

"And the spring arose on the garden fair, like the spirit of joy felt everywhere;

And each flower and herb on earth's dark breast Rose from the dreams of it's wintry rest"

Best wishes and regards

Editorial team AOGD (2023-2024)

Evaluating Unexplained Stillbirth: A Road Map

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One of the most common adverse pregnancy outcomes is the death of the fetus. Stillbirth is defined as the death of a fetus that has reached a certain gestational age and which shows no signs of life e.g. absence of breathing, heart beats and absence of pulsations in umbilical cord with no voluntary movement of muscle. There are different definitions for stillbirth across countries based on different gestational age cut-offs leading to discrepancies and inaccurate comparisons in international reporting. To address this, WHO recommends standardising the international stillbirth definition for epidemiology studies, utilising a birthweight of >1000 g and/or >28 weeks gestation[1].

Causes of still birth

Traditionally, the causes of stillbirth have been classified into maternal, fetal, placental and idiopathic factors. In low-income countries, key factors contributing to stillbirths include obstructed or prolonged labor, preeclampsia, and infections, whereas high-income countries predominantly experience stillbirths due to congenital, anatomical or karyotype abnormalities, placental issues leading to growth restriction, and maternal medical conditions[2]. Important contributing factors in low-income countries include lack of skilled birth attendants, basic emergency obstetric care, adequate antenatal care for detection and management of conditions like pre-eclampsia, diabetes, malaria, and syphilis. Additionally, the absence of periconceptional folic acid fortification, identification of growth restriction, and timely referrals for complicated pregnancies, including post-dated pregnancies, play a significant role.

It is crucial to determine the precise cause of death in stillbirth cases, as this information not only aids parents in comprehending the circumstances surrounding their baby's demise but also provides essential support for them to cope with the loss. Furthermore, understanding the cause of stillbirth plays a vital role in guiding care during subsequent pregnancies, with the aim of mitigating the risk of further perinatal deaths in this vulnerable population.

Work up of a woman following stillbirth

A detailed history and physical examination should be done in an effort to find out the etiology of stillbirth. A three-generation pedigree should also be made with emphasis on history of consanguinity, recurrent spontaneous abortions or stillbirth, congenital anomalies or chromosomal abnormalities, hereditary syndromes or developmental delay.

Advanced maternal age, multifetal gestation, obstetric conditions (e.g., intrahepatic cholestasis, preterm labor, rupture of membranes), gestational diabetes/hypertensive disorders, fetal anomalies on ultrasound, abruptio placentae, abdominal trauma and infections may be responsible for stillbirth and should be looked for.

Previous history of recurrent miscarriages or stillbirth, history of a child born with an anomaly or developmental delay or a known genetic condition, history of hypertensive disorder/ gestational diabetes/ abruptio placentae or growth restriction in previous pregnancy may have implications in the current pregnancy also.

Personal or family history of venous thromboembolism, thrombophilia or autoimmune diseases (e.g., SLE), is also significant. Any pre-existing medical conditions like diabetes mellitus, chronic hypertension, heart disease, substance abuse or any intake of medications needs to be asked in detail.

Identifying consanguinity is crucial, as it increases the likelihood of several autosomal recessive disorders. Whenever possible, it is

recommended to acquire the original medical records and documentation. Comprehensive records should be maintained, covering gestational age, maternal examinations, laboratory results, and ultrasound findings.

Surprisingly, a significant proportion, ranging from 25-60%, of all fetal deaths remains unexplained[3]. Notably, stillbirths occurring near term are more likely to be classified as unexplained compared to those happening earlier in pregnancy.

Maternal Laboratory Evaluation

All women with previous stillbirth should undergo preconception counselling. The investigation should be carried out depending on previous obstetrical history and risk factors as per the tests highlighted in table1.

Infectious pathogens can result in stillbirth, through direct fetal infections, placental dysfunction, severe maternal illnesses, and spontaneous preterm births. Ascending bacteria (e.g. Group B streptococcus, Escherichia coli) and hematogenous spread of infectious agents (e.g. Listeria monocytogenes, syphilis) may cause placental and fetal infections. Viruses like cytomegalovirus, parvovirus, and Zika virus are associated with stillbirths. Causation cannot be established based only on positive maternal serological tests and a thorough autopsy and placental examination, along with molecular testing, if available is crucial for identification.

Post delivery Evaluation

Apart from conducting a fetal autopsy, examination of the placenta, umbilical cord, and membranes, along with genetic testing must be undertaken for stillborn infants.

Test	Purpose	Recommendations
Complete Blood Count (CBC)	Assess severity of anemia; may aid in diagnosing maternal disorders, including infections and inherited hemoglobinopathy.	Considered a standard test for assessing overall health and detecting various disorders.
Glycosylated Haemoglobin or Blood Glucose Levels	detect gestational diabetes in previously untested patients or gives an idea about the glycemic control as a cause of stillbirth in known diabetic patients.	Recommended for detecting gestational diabetes in pregnant women, especially if not previously tested.
Thyroid Function, Bile Acids, and Liver Chemistry	Advised based on clinical suspicion.	Should be conducted when there are signs or symptoms indicating potential issues with thyroid, bile acids, or liver function.
Indirect Coombs' Test	Fetomaternal haemorrhage (FMH) testing, including Kleihaur-Betke and flow cytometry should be done in all patients with an unexplained stillbirth since detecting a large FMH may explain an otherwise unexplained stillbirth.	Recommended in all patients to exclude red cell alloimmunization as a cause of stillbirth.
Antiphospholipid Syndrome Testing	Indicated in women with fetal growth restriction, preeclampsia, venous thrombosis in the family, or other evidence of placental insufficiency. Testing for inherited thrombophilia should be considered in certain cases, such as evidence of abruption, severe infarction or thrombosis, or substantial vascular malperfusion in the placenta.	Positive results should be confirmed after 12 weeks to ensure accuracy.
Anti-Ro/LA (SSA-SSB)	Indicated if evidence of fetal hydrops, endomyocardial fibroelastosis, or calcification of atrioventricular nodes at post-mortem.	
Haemoglobin Electrophoresis	Done when the fetus is hydropic with maternal anemia, or thalassemia is considered in the differential diagnosis.	Useful for identifying specific types of haemoglobin and can assist in diagnosing conditions like thalassemia.
TORCH serology	TORCH testing should be considered in women with a history of infection or if autopsy/placental findings suggest an infective etiology.	Routine TORCH testing is not universally recommended.
Parvovirus serology	Parvovirus serology is advised in cases of fetal anemia or non-immune hydrops	
Serologic testing for syphilis	Serologic testing for syphilis is recommended in women not tested earlier in pregnancy, with a history of sexually transmitted infections, or in areas where syphilis is prevalent.	

Examination of the Stillborn Fetus

Stillborn babies necessitate prompt examination, noting any dysmorphic features along with measurements to ascertain weight, length, and head circumference9. Thorough assessment of the entire body, including the face, extremities, and palms, along with close-up photographs of specific anomalies, is crucial for subsequent review and consultation with a geneticist.

X-rays of the entire body, with antero-posterior and lateral views, may reveal undiagnosed skeletal abnormalities or further define the previously diagnosed deformities.

Fetal autopsy can be invaluable in determining the cause of a death and are preferably conducted by perinatal/pediatric pathologists. An autopsy can provide new insights into the cause of death or change the clinical diagnosis. Autopsies should include measuring gestational age, estimating time between death and delivery, diagnosing intrinsic abnormalities and developmental disorders, and looking for infection evidence.

Families uncomfortable with a complete autopsy have alternative options, including partial autopsy, gross examination by a trained pathologist, ultrasound, and magnetic resonance imaging.

Postmortem magnetic resonance imaging (PMMRI) is a non-invasive cross-sectional imaging technique that is generally accepted by parents who refuse fetal autopsy. It is possible to perform minimally invasive autopsies based on post-mortem cross-sectional imaging, in combination with less invasive histological tissue sampling, such as percutaneous or laparoscopically guided biopsy, if fetal tissue sampling is required.

Chromosomal and Genetic Evaluation

The karyotype of stillbirths can be abnormal in 6–13% of cases, with common karyotypic abnormalities noted being trisomy 21 (31%), monosomy X (22%), trisomy 18 (22%),and trisomy 13 (8%)[5]. Karyotyping is recommended for fetuses with anomalies, hydrops, growth restrictions, and dysmorphic characteristics. A high rate of culture failure, especially in macerated stillbirths, is one of karyotype's drawbacks. Also, karyotype cannot pick up abnormalities at the sub microscopic level.

Microarray analysis in SB has a higher diagnostic yield than conventional karyotyping. It can detect aneuploidy as well as copy number variants (smaller deletions and duplications), and can be used to determine consanguinity and uniparental disomy that cannot be detected by karyotype analysis.

Examination of the Placenta

A qualified pathologist must conduct a thorough examination of the placenta, umbilical cord, and fetal membranes. Gross examination may identify disorders such as abruption, umbilical cord thrombosis, velamentous cord insertion, and vasa previa. Placental histology can pick up thrombosis and genuine knots in the cord, infarcts, calcifications, hematoma, abruption and vascular malformation in the placenta, along with subclinical infection, as in funisitis, and amnionitis.

Follow up visit

A "wrap-up" meeting is scheduled when all results of testing and the autopsy are available. The cause or possible causes of the stillbirth, risk for recurrence, and, if desired, a plan for the next pregnancy is discussed. Smoking and obesity, as modifiable risk factors, should be addressed before the next pregnancy.

Care in subsequent Pregnancy following stillbirth

Providing effective care to women in subsequent pregnancies after an unexplained stillbirth involves addressing potential risk factors through pre-pregnancy counseling. Although there is no level-one evidence to guide doctors in managing pregnancy following unexplained stillbirth, identifying and managing factors like obesity, smoking, and specific maternal diseases is crucial.

Although the odds ratio for recurrent stillbirths from all causes is almost five, the risk of unfavorable pregnancy outcomes, such as

preterm birth, placental abruption, and low birth weights, is also increased in subsequent pregnancies. According to several studies, pregnancies following stillbirth are more likely to result in induced labor, elective and emergency cesarean sections, premature birth, and low birth weight babies. Obstetricians generally recommend induction of labor or elective cesarean delivery, sometimes as early as 36 weeks, irrespective of other obstetric issues.

Due to their poor predictive value, routine biochemical assessment of placental function and routine uterine artery Doppler in early gestation are not universally recommended. Routine ultrasound monitoring, particularly at 28 and 34 weeks, is advised due to the higher risk of impaired fetal growth in women with a history of stillbirth.

Umbilical artery Doppler screening of high-risk individuals has shown to reduce perinatal mortality, and hence, is generally advised in these pregnancies between 28 and 34 weeks of gestation. If surveillance finds an unfavourable fetal state, clinical care and delivery time should be planned.

Medical treatments to improve placental function, such as low-dose aspirin, may reduce the incidence of stillbirth by increasing blood flow or reducing inflammation. It should preferably be started before 16 weeks of pregnancy and continued for at least 36 weeks, 150 mg once at night. Pre-eclampsia, spontaneous preterm birth, FGR, and placental insufficiency decreases may be of benefit. Routine use of Low-molecular-weight heparin (LMWH) for preventing fetal problems in women with a history of stillbirth is currently not supported by high-grade evidence.

Chronic histiocytic intervillositis (CHI) is a rare placental condition associated with poor obstetric outcomes and an 80% recurrence risk in subsequent pregnancies. In a multicentre study[6], quadruple therapy (aspirin, LMWH, prednisolone, and hydroxychloroquine) significantly improved live birth rates from 32% to 67%, outperforming aspirin alone for better pregnancy outcomes.

The single most important factor in the management of otherwise normal pregnancies following an unexplained stillbirth, according to many authorities, may be delivery by 39 weeks. If delivery is postponed beyond this gestation, the fetus should be reevaluated by ultrasound to measure amniotic fluid volume, abdominal circumference, and umbilical artery flow.

Psychological Effects and Follow-Up

Pregnancies following stillbirth are associated with negative psychological effects, including sadness, post-traumatic stress disorder, and anxiety. Higher rates of anxiety and depression symptoms are observed in some women during pregnancy and the postpartum period. Care professionals should not only provide psychological evaluation but also offer focused follow-up, referrals, and therapy when necessary, emphasizing support for the family.

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Rh negative isoimmunised pregnancy- Practice essentials

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Background

Isoimmunisation or alloimmunisation is development of antibodies against antigens of different individuals of same species. Rh isoimmunisation is the development of antibodies against Rh antigens present on the surface of Red blood cells. This can lead to haemolytic disease of fetus and newborn with significant morbidity and mortality. With proper monitoring and management good prognosis can be expected.

Human Red blood Cells (RBCs) contain ABO antigen and Rh antigens. Rh blood group system consists of around 110antigens among which five antigens D, C, c, E and e are most important. D antigen is most immunogenic of all non-ABO antigen. Rh positive or negative status refers to presence or absence of D antigen. Two genes Rh D and RH CE code for Rh antigens, they are present in close proximity on chromosome 1. Rh D codes for D antigen and Rh CE codes for CE antigens in various combinations. Both the genes are 97% identical and have ten exons. RhD and RhCE proteins differ by 32-35 of 416 amino acids. The large number of amino acid changes explains why exposure to RhD can result in a potent immune response in a D-negative individual. Individuals who are Rh or D negative most often have a complete deletion of the RHD gene.

There are some variants of D antigen, partial D (some epitopes of antigen D absent), weak D (weakly expressed D antigen epitopes) which may or may not present as D positive in serological antigen testing. Patients carrying theses variants are potentially at risk of developing anti D antibodies and should be given prophylaxis if not previously sensitized.

Around 1.5-2.5% obstetric patients can have antibodies to minor antigens which generally develop after incompatible blood transfusion like Anti kell, anti Duffy, anti Kidd etc. Management is same as for Rh D isoimmunised pregnancies except for anti kell which requires more intensive monitoring as anti kell in addition of hemolysis leads to suppression of fetal erythroid precursors.

Pathophysiology

Rh incompatibility can occur by two mechanisms. Most commonly it occurs when an Rh negative pregnant mother is exposed to Rh positive fetal blood cells secondary to fetomaternal hemorrhage during the course of pregnancy from spontaneous or induced abortion, trauma, invasive procedures or normal delivery. Secondly, it can occur if an Rh negative female receives Rh positive blood transfusion.

After a sensitizing event in first pregnancy with Rh positive fetus maternal immune response is weak and IgM antibodies are produced which are unable to cross placenta. In subsequent Rh positive pregnancies, even with small dose strong immune response is generated and Ig G antibodies are produced which can cross placenta and form antigen antibody complex with Rh D positive erythrocytes and lead to hemolysis and fetal anemia. Anemia leads to activation of fetal reticuloendothelial system and medullary and extramedullary hematopoiesis. The resultant hyperdynamic circulation leads to cardiomegaly. Also, there is development of hepatosplenomegaly and portal hypertension. There is decreased protein synthesis and decreased oncotic pressure leading to ascites, scalp edema, hydrothorax, placentomegaly and immune hydrops and fetal death. If the fetus survives in utero and is delivered, the ongoing hemolysis and fetal liver immaturity leads to hyperbilirubinemia of variable degrees.In severe cases kernicterus and brain injury can occur.

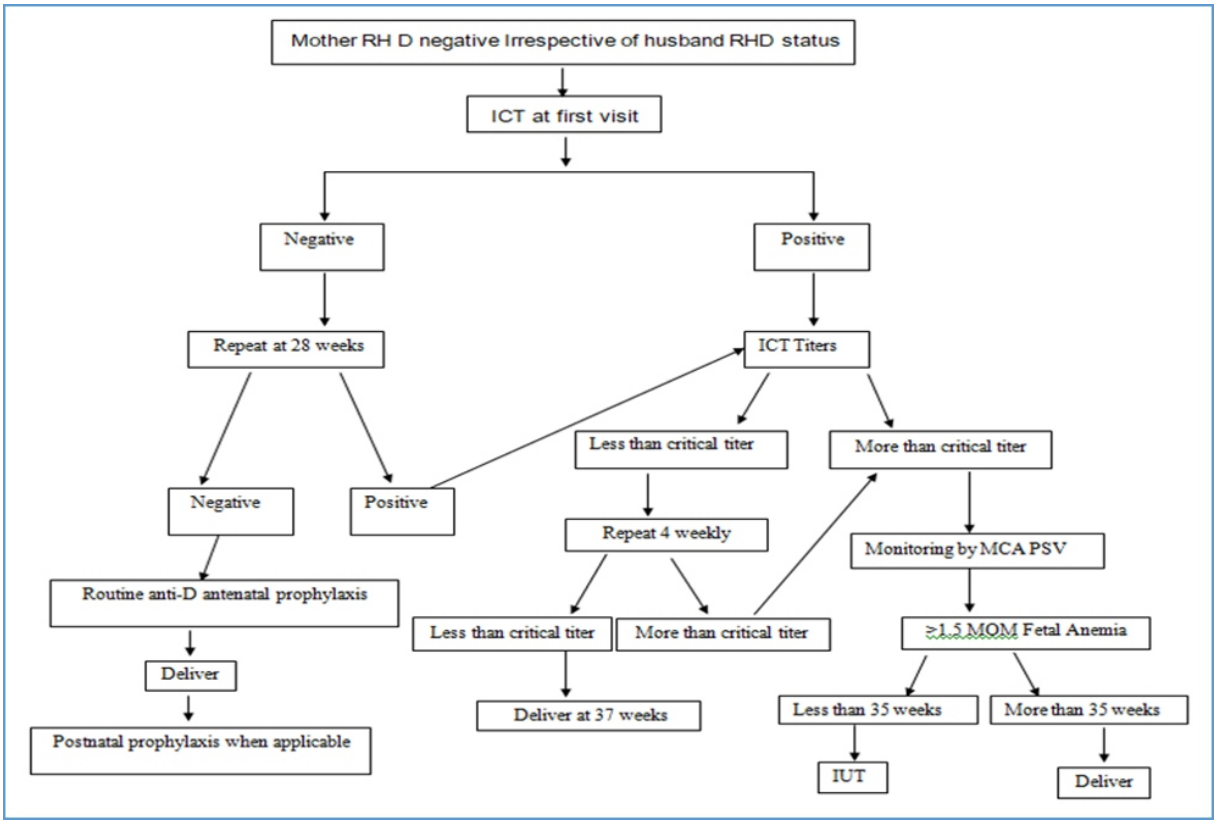

Figure 1: Management of Rh negative pregnancy

The risk of alloimmunisation depends on various factors like amount of fetomaternal haemorrhage and maternal immune response. Fetomaternal hemorrhage sufficient to cause alloimmunisation occurs most commonly in uncomplicated vaginal deliveries. The volume of fetal as less as 0.1ml can result in alloimmunisation. Specific clinical factors such as cesarean delivery, multifetal gestation, bleeding placenta previa or abruption, manual removal of the placenta, and intrauterine manipulation may increase the volume of fetomaternal hemorrhage. Kleihauer test should ideally be done to detect excessive fetomaternal hemorrhage which may require additional Anti D dose but unfortunately this test is not available in most centers.

Epidemiology

The prevalence of Rh negative people is 15% in Caucasians, 4-8% in black population and 1% in Asians. It is reported to be around 5-8% for Indian population. If a Rh negative pregnant woman does not receive anti D prophylaxis after birth of Rh D positive infant, the incidence of sensitization is 12-16%. The rate of sensitization has reduced to 1.6-1.9% after introduction of postpartum prophylaxis and further to 0.2% after addition of antepartum prophylaxis as well. In India the incidence of isoimmunisation is more due to lack of awareness and proper prophylaxis. Although literature is scarce, few studies have reported incidence up to 7%. Associated perinatal morbidity and mortality worsens with each subsequent Rh-positive pregnancy. But with proper management of rh isoimmunised pregnancies survival of 80-95% has been reported.

It requires team management including obstetrician, maternal fetal medicine specialist, blood transfusion lab and neonatology.

Management

History

With all Rh negative pregnancies detailed history should be taken:

- History of prior blood transfusion
- Previous pregnancies including spontaneous and elective abortion
- H/o sensitizing event in previous and current

pregnancy- bleeding, trauma, invasive procedure

- Previous administration of Rh immunoglobulin - time, dose and route
- H/o previous pregnancy outcome- weeks at affection, hydrops, IUD, h/o neonatal jaundice, exchange transfusion, neonatal death

Practice algorithm is described in figure 1.

Investigations

Indirect Coombs test(ICT)

All women should have blood group test and if found to be D negative should have ICT irrespective of husband blood group and RhD status. This forms basis for diagnosis of Rh isoimmunisation. If ICT is positive then baseline titers should be obtained. In general, women with titers higher than 1:4 should be considered Rh alloimmunised. Titers tend to correlate more reliably with the severity of fetal disease in the first sensitized pregnancy than in subsequent pregnancies.

For those in whom there is no previous history of affection, serial monitoring of titers should be done 4 weekly till it reaches critical titer. More frequent monitoring may be needed with rising values or advanced gestation. Critical titer for a lab is that value of titer at which severe fetal anemia and hydrops has been observed. For most labs the value is between 1:8 to 1:32.

If there is a previous history of affection, then monitoring for fetal anemia should begin atleast 8-10 weeks before previous gestation of affection even if titers have not reached critical value.

There can be interlab variations in the titer values so preferably same lab should be used for monitoring. Difference of more than one dilution is considered significant. Most labs do not have adequate data base to define their critical titer value. Lab should be contacted if critical titer is not mentioned and if they cannot provide value then for values more than 1:8 or 1:16 monitoring for fetal anemia should be initiated.

For isoimmunization with antibodies other than D similar monitoring for ICT titers should be done except for anti Kell antibodies. Anti kell antibody levels do not correlate with severity of affection and more intensive fetal monitoring needs to be done even with lower ICT titers.

Determination of genotype

When paternity is certain, if the father is Rh D negative the fetus is also Rh D negative. If the father is Rh D positive, he can be either homozygous or heterozygous for the D allele. If he is homozygous for the D allele, the fetus is Rh D positive. However, if the paternal phenotype is D antigen positive and his genotype is heterozygous, fetal antigen status should be determined by cell free DNA analysis as there are 50% chances of fetus being Rh D negative. Determination of fetal Rh D status can be offered to the couple by cell free DNA analysis. The test has sensitivity of 97 -99% with slightly better sensitivity in second trimester. Since it is not 100%, so even with negative Rh status of fetus non invasive fetal monitoring for fetal anemia is suggested. The tests is now available with some genetic labs and genetic centers.

Role of invasive testing

Invasive testing like amniocentesis or chorionic villus sampling only for determining fetal rh status is not practically suggested.

Invasive testing for other fetal indications is not contraindicated and can be done when needed. Request for Rh D genotype can be placed simultaneously if the lab has validated results. Routine anti D prophylaxis is not needed in already isoimmunised cases with positive anti D titers.

Amniocentesis and plotting of Lily's curve is outdated these days after the advent of non invasive monitoring for fetal anemia by middle cerebral artery doppler.

Monitoring by Fetal Middle cerebral artery peak systolic velocity(MCA PSV)

Before 2000, amniocentesis and cordocentesis were used for determining fetal affection, but now days non invasive monitoring of fetal anemia by estimating middle cerebral peak

systolic velocity has become standard for monitoring of fetal anemia. This should be done by an expert taking care of following steps to minimize false positive and negative results.

Steps

- ✓ Fetus should be in quiescence and undue pressure on probe should be avoided.
- ✓ An axial section of the brain, including the thalami and the cavum septi pellucidi is obtained. The circle of Willis is visualized and the middle cerebral artery of one side is examined close to its origin in the internal carotid artery, the systolic velocity decreases with distance from the point of origin of this vessel.
- ✓ The angle between the ultrasound beam and the direction of blood flow is to be kept as close as possible to 0 degrees.
- ✓ The highest point of the wave form (peak systolic velocity) is measured.
- ✓ Average of 3 velocities should be taken.
- ✓ Multiples of median (MOM) should be calculated for that gestational age using reference chart (Table 1).Now a days many online softwares are also available for calculation of MOM of MCA PSV.
- ✓ For values of MCA PSV (Table-1)
  - ▫ <1 MOM:2-3 weekly follow up can be done.
  - ▫ 1-1.25 MOM: 2weekly follow up
  - ▫ 1.25-1.5 MOM: Weekly follow up

If there is previous history of affection or increasing titers then follow up frequency to be increased.

Table -1: Expected peak velocity of systolic blood flow in the middle cerebral artery as a function of GA

	Multiples of the median, cm/s			
GA, Wks	**1**	**1.29**	**1.5**	**1.55**
18	23.2	29.9	34.8	36
20	25.5	32.8	38.2	39.5
22	27.9	36	41.9	43.3
24	30.7	39.5	46	47.5
26	33.6	43.3	50.4	52.1
28	36.9	46.6	55.4	57.2
30	40.5	52.2	60.7	62.8
32	44.4	57.3	66.6	68.9
34	48.7	62.9	73.1	75.6
36	53.3	69	80.2	82.9
38	58.7	75.7	88	91
40	64.4	83	96.6	99.8

Source: Mari G, Deter RL, Carpenter RL, et al

Measurements of the MCA PSV predict the presence of moderate or severe anemia in fetuses with a sensitivity of 100%, false positive rate of 12 % and has positive predictive value of 65% and negative predictive value of 100%. For values above 1.5 MOM there is a significant risk for fetal anemia. If MCA PSV is more than 1.5 MOM, the test should be repeated after 3 days and if still high intrauterine transfusion or delivery should be planned depending upon the gestational age.

Non-invasive diagnosis by Doppler ultrasonography of fetal anemia due to maternal red-cell alloimmunization. Collaborative Group for Doppler Assessment of the blood velocity in anemic fetuses. N Engl J Med. 2000; 342(1): 9-14.

Intrauterine transfusion (IUT)

Intrauterine transfusion should be planned once MCA PSV is more than 1.5 MOM or fetus is showing signs of hydrops. IUT is a very effective therapy in correcting anemia.It has its complications like fetal distress, preterm labour, cord accidents,formation of new antibodies happening in upto 5% patients. Detailed consent should be taken before procedure. For procedure beyond viability steroid cover for lung maturity should be given and arrangements should be done beforehand for immediate operative delivery in case of fetal distress.

Packed Red blood cells which are fresh (less than 5 days old),O negative for Rh D, kell and other maternal alloantibodies, leucocyte depleted, Heamatocrit of 75-80%,Irradiated and CMV negative should be used.

Site of transfusion depends upon the accessibility. It can be done intraumbilical (preferably into placental cord insertion of umbilical vein or free loop of cord), Intrahepatic(portal vein) or intraperitoneal (in small fetsuses < 24 weeks). For the transfusion, local analgesia is given to mother and fetus can be paralysed by giving vancuronium or atracurium

intramuscular in fetal thigh. 20 gauge spinal needle is used. Prior to the transfusion, 1 mL of fetal blood is tested to assess baseline Hct proportion, complete blood count and reticulocyte count and blood group in first transfusion. If fetal anaemia is confirmed, the transfusion is performed at a rate of 5 mL/minute, with close fetal monitoring and targeting to raise the fetal Hct proportion to 45–50%, except in cases of hydrops fetalis. In hydropic fetuses, target is upto 2 to 3 times of pretransfusion haematocrit to avoid volume overload. In hydropic fetus IUT can be planned in two sittings where half of volume is transfused 24–48 hours later.

Volume to be transfused =

$$\frac{\mathbf{V}_{\text{fetoplacental}} \text{ X } (\mathbf{Hct}_{\text{final}} - \mathbf{Hct}_{\text{initial}})}{\mathbf{Hct}_{\text{transfusedblood}}}$$

Fetoplacental volume ($\mathbf{V}_{\text{fetoplacental}}$) = Fetal weight in gm × 0.14.

Heamotocrit ($\mathbf{Hct}_{\text{final}}$) is around 40-50%

$\mathbf{Hct}_{\text{transfused}}$ blood is as mentioned on the packed RBC bag is usually 70-80%.

In case of intraperitoneal transfusion, the volume is calculated as (period of gestation in weeks – 20) × 10 ml.

Following the first transfusion, the expected average daily decline in the fetal hematocrit is around 1% per day. Rate of decline is more in cases of hydrops and co existing other antibodies. In case of combined intravascular and intraperitoneal transfusion, the rate of decline in hematocrit is slower, around 0.01 vs 1.14% per day in case of intravascular transfusion alone. Following first and at most 2nd IUT, subsequent MCA PSV values are less reliable for deciding the need for further IUTs as the fetal blood is replaced by adult RBCs. Thus subsequent IUTs (third and beyond) should be planned based on predicted decline of haematocrit rather than MCA PSV values.When expected haematocrit is between 25-30% next IUT should be planned.

Time of delivery

There are no guidelines as such for time of delivery. After 34 weeks risk of IUT procedure should be weighed against risk of prematurity. Now a days in centers with good expertise IUT is being done till 36-37 weeks. Delivery should preferably be planned at such a gestation when expected hematocrit is around 25 to 30% and fetus is not severely anemic.

Novel therapies

In very severely affected pregnancies with very high titers, with early loss, hydrops or a first IUT <24 weeks in previous pregnancy, IVIg with plasmapheresis or IVIG alone can be given from early gestation. Various protocols have been mentioned in various studies. These therapies may delay need for first IUT but are costly.

Suggested Reading

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ALGORITHM

Evaluation of Recurrent Pregnancy Loss

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INTRODUCTION

Pregnancy losses are common entities affecting 15-20% of all pregnancies before 20 weeks of gestation. However, 2 losses may be seen in about 3% pregnancies and 3 or more are seen in around 1% cases[1,2].

Early pregnancy losses may either be sporadic or recurrent. Sporadic losses can be mainly attributed to chromosomal abnormalities and their incidence increases with increasing maternal age. On the other hand, recurrent miscarriages may not be associated with any chromosomal abnormalities and the risk of recurrence is proportional to the number of previous losses.

DEFINITION

Various definitions for Recurrent pregnancy losses have been provided.

- American society of reproductive medicine (ASRM)[4] in their 2012 guidelines have defined RPL as 3 or more clinical early pregnancy losses (documented by ultrasonography or histopathological examination). However, this definition was only to be used for epidemiological studies.
- Most guidelines including ASRM[3] and ESHRE[5] agree that clinical evaluation should be started following 2 pregnancy losses.

The diagnosis of RPL is a source of great psychological stress and trauma to the couple. A step-wise systematic approach is needed for evaluation and counselling of the couple to help provide answers and prevent further losses.

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Evaluation of Recurrent 1st and early 2nd trimester pregnancy losess
History and examination
Menstrual irregularities- Hyperprolactinemia
Previous uterine instrumentation- adhesions; incompetent cervix
Consanguinity, inheritable genetic or chromosomal abnormalities
Exposure to environmental toxins
Previous history of arterial or venous thrombosis
BMI, h/o alchohol, smoking, caffiene intake
Examination of Uterus and adnexa- USG (TVS), MRI, Sonosalpingography, HSG and hystero-laproscopy(if required)
Uterine shape and contour for adhesions, myomas, sepatations and mullerian abnormalities
Normal
Abnormal
Treat
Immunological factors
Antiphospholipid antibodies- Anti-cardiolipin(IgG and IgM), Lupus anti-coagulant, B2 glycoprotein 1- IgG and IgM
Inherited Thrombophilias (past or family history, placental HPE showed evidence of ischemia or infarction, 2nd trimester loss)- Factor 5 Leiden, Prothrombin gene mutation, Protein S deficiency
Treat with LMWH and low dose aspirin
Endocrinological
Serum Prolactin levels
Blood sugar profile: HbA1C
Thyroid profile and Anti-TPO
Genetic evaluation
Chromosomal Microarray on Product of conception sample (cGRH array or SNP) or QPCR,MLPA
Aneuploidy
Recurrence risk <1%
Euploid
Exome sequencing of POC
Couple Carrier screening(Whole exome sequencing- Next generation sequencing)
Parental Karyotype(balanced translocations,Inversions or Robertsonian translocation)(if deletion/duplication >5-10Mb)
Genetic counselling for recurrence risk, PGT-SR,A, gamete donation or Prenatal diagnosis
Unbalanced Translocation, deletions/duplications or inversion
Parental Array(if deletion/duplication <5-10Mb)
Unexplained
Parental Karyotype(where no POC evaluation done)
Couple carrier screening
Sperm DNA fragmentation- controversial
?Luteal phase defect test
Look and treat for Bacterial vaginosis
?Chronic endometriosis

Mullerian anomalies and reproductive surgeries in RPL

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Introduction: Congenital Mullerian abnormalities like septate uterus, bicorporeal uterus with the normal cervix (bicornuate uterus), bicorporeal uterus with the double cervix (didelphic uterus) and hemi-uterus (unicornuate uterus), all has been reported to be associated with recurrent pregnancy loss (RPL). An association has been seen between Mullerian anomalies of the uterus and recurrent pregnancy loss. The prevalence of uterine anomalies in women with RPL was 13.3% compared to 5.5% in women with infertility[1]. Further, the prevalence of, miscarriage is higher in women with Mullerian anomalies. According to a meta-analysis of comparative studies, women with septate uterus (RR 2.65, 95%CI 1.39-5.09) and bicornuate uterus (RR 2.32; 95%CI 1.05-5.13) had an increased probability of first-trimester miscarriage compared to controls. Women with the arcuate uterus (RR 2.27; 95%CI 0.64-7.96), septate uterus (RR 2.95; 95%CI 1.51-5.77) and bicornuate uterus (RR 2.90; 95%CI 1.56-5.41) had an increased probability of second-trimester miscarriage[2]. A study has evaluated 689 women found to have a septate uterus during diagnostic evaluation during infertility workup. The reproductive outcomes of these women were compared with obstetric outcomes in 15,060 women in the general pregnant population. Early miscarriage was seen in 41.1% in patients with septate uterus compared with 12.1% in the control population. Late abortions and pre-mature deliveries developed in 12.6% of patients with septate uterus compared with 6.9% in the general population[3].

Diagnosis: Literature supports the high prevalence of uterine anomalies in RPL, so this condition should be screened for in women with RPL[4]. There are various options available like hysterosalpingography (HSG), ultrasonography (2D and 3D), sonohysterography (SHG), Magnetic resonance imaging (MRI), hysteroscopy and laparohysteroscopy. Laparoscopy with hysteroscopy is the gold standard test for diagnosing Mullerian abnormality of the uterus as it allows for direct visualization of external and internal contours of the uterus. As this modality is invasive, it is not the first-line investigation of choice. The 2D USG and HSG are basic investigations that are widely available. Though 2D USG and high sensitivity in the diagnosis of uterine anomalies, sensitivity is low. Hysteroscopy and HSG visualize only the internal contour of the uterus, not the external one, thus cannot differentiate between the septate and bicornuate uterus. The SHG has better sensitivity and specificity than HSG or hysteroscopy to diagnose uterine malformations. Further, SHG can see the patency of tubes also. So diagnostic modality can be chosen when testing of tubal patency is needed along with workup for RPL. The problem with SHG is that it can be uncomfortable for the patients as saline or contrast media is instilled inside the uterus. The 3-D USG has the advantage of visualizing both internal and external contours of the uterus and has high sensitivity and specificity in diagnosing Mullerian anomalies. Further, it is a non-invasive modality. This can be the only modality for evaluating the uterine cavity as it has a high accuracy of diagnosis. The MRI allows for visualization of both external and internal contours of the uterus, still, its accuracy and practicality have not been determined for diagnosing uterine malformations. Table 1: The ESHRE 2022 recommendation for diagnosis of uterine malformations[4]

Mullerian anomalies may be associated with renal anomalies in almost 11-33% of individuals. Hence, once the Mullerian anomaly has been diagnosed, further imaging should be done to rule out renal and urinary tract abnormality.

Table 1

Modality	Recommendations
TVS 3D USG	The preferred technique to evaluate the uterus, it has a high sensitivity and specificity and can distinguish between septate uterus and bicorporeal uterus.
Sonohysterography (SHG)	More accurate than HSG in diagnosing uterine malformations. It can be used to evaluate uterine morphology when 3D US is not available, or when tubal patency has to be investigated.
MRI	Not recommended as first line option for the assessment of uterine malformations but can be used where 3D US is not available.

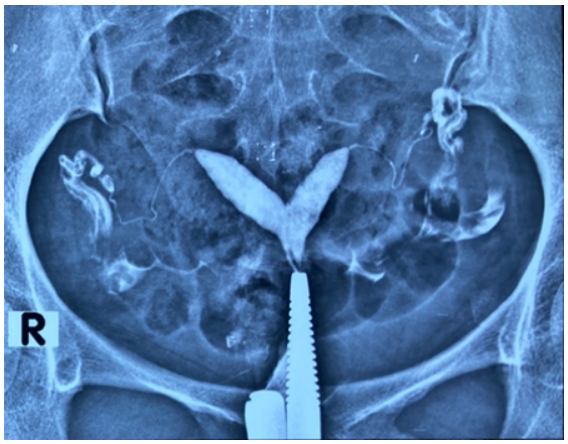

Figure 1: Hysterosalpingography of septate uterus

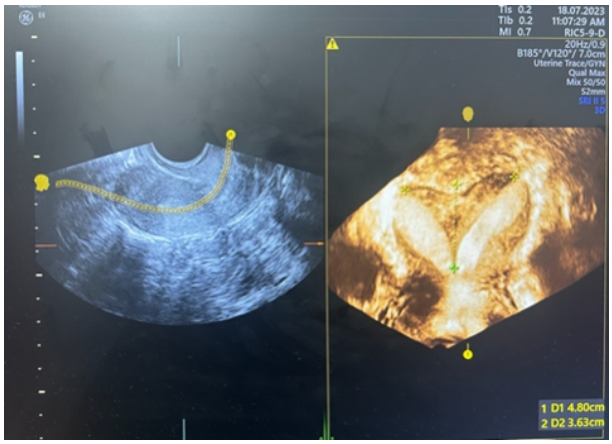

Figure 2: 3D Ultrasound showing septate uterus with minimal fundal indentation

Treatment options: Various reconstructive surgeries are available in women with Mullerian anomalies and RPL and the exact type of constructive surgery depends on the associated uterine anomaly. The usefulness of corrective surgeries to treat recurrent pregnancy loss is not very clear.

For the septate uterus, older studies have documented abdominal metroplasty. Now hysteroscopic metroplasty is the preferred method due to less morbidity, low risk of intrauterine adhesion and simple procedure. The septal resection for RPL is not universally accepted by evidence. Non-controlled and observational studies support the beneficial effect of hysteroscopic septal resection. Krishnan et al., did a meta-analysis of 7 studies which included women with uterine septum and a history of subfertility and/or poor reproductive outcomes. This meta-analysis showed that hysteroscopic septum resection decreases the rate of pregnancy loss compared with women with conservative management (OR 0.25; 95%CI 0.07-0.88) without any significant effect seen on live birth, clinical pregnancy rate or preterm delivery[5].

Another meta-analysis by Carrera et al., showed also that hysteroscopic metroplasty reduced the risk of pregnancy loss in patients with a complete uterine septum (OR 0.16; 95%CI 0.03-0.78) or a partial uterine septum (OR 0.36; 95%CI 0.19-0.71) without any effect on clinical pregnancy rates, the live birth rates and the risk of caesarean delivery [6]. A prospective study was done on 124 women with RPL (≥2 PLs) and septate uterus. A total of 109 underwent septal resection surgery. In women that achieved pregnancy, 78 of 96 (81.3%) women treated with surgery and 8 of 13 (61.5%) women without surgery delivered a live born at the first pregnancy after examination without any significant differences in preterm birth, low birth weight or caesarean section. The TRUST trial, compared 79 women with a septate uterus randomly assigned to septum resection

(n=39) or expectant management (n=40). The trial showed no benefit from septum resection in terms of pregnancy loss (RR 2.3; 95%CI 0.86-5.9), clinical pregnancy (RR 1.2; 95%CI 0.77-1.2), ongoing pregnancy (RR 0.95, 95%CI 0.52-1.8), live birth (RR 0.88, 95%CI 0.47-1.7) or preterm birth (RR 1.3; 95%CI 0.37-4.4) rates[7]. Similarly a large cohort study found similar results that septum resection does not lead to improved reproductive outcomes compared to expectant management for women with a septate uterus.

Various methods have been documented for hysteroscopic septal resection like cutting the septa with scissors, and use of electrosurgery by resectoscope using Collin's knife. The energy used in Collin's knife can be either monopolar or bipolar. Studies have not shown the superiority of one method over the other. At present, There is insufficient evidence to recommend a specific method for hysteroscopic septum incision. There are complications associated with this surgical intervention like uterine perforation, intrauterine adhesion formation etc. For prevention of uterine perforation laparoscopy guidance and ultrasound guidance have been studied and both were found comparable for this purpose . Almost 18 case reports are there of uterine perforation in pregnancy in patients conceiving after this surgery. The risk factors might be excessive septal excision, penetration of the myometrium, uterine wall perforation, and excessive use of cautery or laser energy during the initial septum incision procedure. Further various methods have been tried for the prevention of adhesion post hysteroscopic septal resection like antibiotics, postoperative estrogen therapy and placement of an intrauterine balloon. At present there is insufficient evidence for or against adhesion prevention treatment, or any specific method following hysteroscopic septum incision.

Corrective surgery for unicornuate uterus is not feasible. Sometimes rudimentary horn may be present with hemi-uterus. It can be with or without a functional endometrial cavity. Ectopic pregnancy can happen in the rudimentary horn of the uterus. Further, patients can have dysmenorrhoea due to blood collection in the functional endometrial cavity. So, in these cases, laparoscopic removal of the rudimentary horn should be considered to avoid these complications. Hysteroscopic metroplasty to increase the size of the uterine cavity has been described, but evidence does not support this intervention in improving reproductive outcomes.

In cases of bicornuate uterus, metroplasty is the only option. This can be done either transabdominal or laparoscopic route. Sugiura-Ogasawara M et al. evaluated 46 patients with bicornuate uterus. Out of those 14 underwent surgery and 32 did not have surgery. The authors in live birth rate showed women with a bicornuate uterus, but surgery tended to decrease the preterm birth rate and the low birth weight in women with RPL. Overall, there is no strong evidence in favour of metroplasty in women having RPL and a bicornuate uterus.

In cases of RPL with a bicorporeal uterus and double cervix (former AFS didelphic uterus), laparoscopic unification of the uterus has been described. Still, the efficacy of surgery is unclear as evidence is based on few studies and few patients.

The T-Shaped uterus, a rare uterine malformation has classically been associated with "in-utero" exposure of DES (diethylstilbestrol). The prevalence of T-shaped uterus is significant even today. Hysteroscopic metroplasty has been tried for this abnormality to increase the size of the uterine cavity. In women with RPL and T-shaped uterus, low-quality evidence from one meta-analysis of 11 cohort studies showed that hysteroscopic metroplasty seems to be effective in improving reproductive outcomes including a higher live birth (56.9%; 95%CI 46.4-66.9, 6 studies) and a lower rate of pregnancy loss (21,5%; 95%CI 15.1-28.6, 8 studies) after the metroplasty[8].

Conclusion: Mullerian abnormalities have been associated with RPL. The corrective surgeries for almost all these anomalies have been described but their efficacy in improving reproductive outcome is not supported by evidence

universally. Well-designed trials with adequate sample size are needed to give clear evidence on the use of corrective surgeries for uterine anomalies in improving reproductive outcomes.

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Awards

Name	Posts
Dr Neerja Bhatla	FOGSI Vice President, North Zone
Dr Achla Batra	ICOG Governing Council member
Dr J B Sharma	ICOG Governing Council member
Dr Poonam Goyal	ICOG Governing Council member
Dr A G Radhika	ICOG Governing Council member
Dr Mala Srivastava	National corresponding editors, Journal of O&G of India
Dr A G Radhika	National corresponding editors, Journal of O&G of India
Dr Poonam Goyal	Chairperson, FOGSI Safe Motherhood Subcommittee

SNAPSHOT

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Septate uterus is the most common Müllerian anomaly in women with an estimated incidence of 0.2–2.3%, subject to the diagnostic methods and classification system. It can be categorised into partial (subseptate) or complete septate groups and is accountable for poor reproductive outcomes and obstetric problems, such as pregnancy loss, preterm birth and fetal malpresentations. The most commonly seen reproductive complication is spontaneous miscarriage, affecting more than 60% of women with uterine septum. The existence of a uterine septum can frequently lead to habitual abortion, although some patients with uterine septum are asymptomatic and are able to conceive and deliver without struggle. The mechanism by which uterine septum causes pregnancy loss is not fully understood

The first step is to identify the septum and dissect at its mid portion to avoid perforating the anterior or posterior myometrium. Next, the tissue shaver is used to remove septal tissue from its attachment to the anterior and posterior uterine walls. Resection progress is constantly assessed by attempting to visualize both the left and right uterine cornua in a single image. Furthermore, the procedure may be done under intraoperative ultrasound or laparoscopic guidance to reduce the risks of inadvertent perforation of the uterine fundus and to ensure an adequate distance between the area being resected and the top of the uterine fundus. Tissue is excised until both the right and left tubal ostia can be observed in one view indicating that the excision is complete.

A meta analysis done in 2021 which included seven studies involving 407 women with hysteroscopic septum resection and 252 with conservative management. Hysteroscopic septum resection was associated with a lower rate of miscarriage (OR 0.25, 95% CI 0.07–0.88) compared with untreated women but, no significant effect was seen on live birth, clinical pregnancy rate or preterm delivery.

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Video of Hysteroscopic Septal Resection using monopolar and bipolar devices

https://youtu.be/_g8XaxmDPFQ?si=eHRzgcy8EXi8jLh2

Ensuring Patient Safety in Hysteroscopy

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Introduction

Hysteroscopy has revolutionized the surgical treatment for benign diseases as well as fertility related procedures. In general, hysteroscopy is a safe and well tolerated procedure. However, few life threatening complications have been reported. Prevention of complication is an important step to provide maximum care. To maximize patient safety, careful surgical planning with proper pre-operative evaluation is necessary.

Preoperative Evaluation and Preparation

Informed consent and Evaluation — Women considering hysteroscopy should be provided with all the details regarding alternate treatment modalities available, expected treatment success rates and possible complications.

A detailed medical history particularly regarding the symptoms that relate to the indication for the procedure; obstetric and surgical history; medical comorbidities, medications and allergies. A complete pelvic and general physical examination is performed, with particular attention to the size and mobility of the uterus and the patency of the cervix.

Timing and endometrial preparation — For reproductive age women follicular phase is preferred for better visualization of the uterine cavity. During the secretory phase, the thickened endometrium can mimic endometrial polyps and lead to inaccurate diagnosis. Also, during menstruation, blood may interfere with visualization.

Cervical preparation and dilation — Adequate cervical dilation is an important step in hysteroscopy, as nearly half of hysteroscopic complications are associated with difficult entry of the hysteroscope through the cervical canal. Although cervical dilation is not required for all patients, but few patients who definitely benefit from cervical dilation include those with history of cervical stenosis, previous cervical surgery, nulliparity, postmenopausal and for the certain procedures in which with larger diameter hysteroscopes like resectoscope is required (hysteroscopic myomectomy).

Timing and selection of approach – Cervical dilation can be done mechanically at the time of the procedure (dilators) or done preoperatively with either cervical ripening agents (misoprostol or dinoprostone). Preoperative dilation is generally preferred to intraoperative dilation because it avoids or reduces the need for mechanical dilation and the associated risks of pain, uterine perforation, and false track creation.

In a 2015 systematic review and meta-analysis of 19 trials addressing preoperative cervical ripening prior to operative hysteroscopy, pre- and postmenopausal women treated with misoprostol were much less likely to require additional mechanical dilation than women treated with placebo or no intervention (odds ratio [OR] 0.08, 95% CI 0.04-0.16) [1]. The meta-analysis also reported that women receiving misoprostol pretreatment had fewer complications than those treated with placebo (OR 0.37, 95% CI 0.18-0.77)[1]. The side effects of misoprostol included mild abdominal pain, vaginal bleeding, and increased body temperature.

In our practice, we generally pretreat patients who are anticipated to need cervical dilation with misoprostol, 200 mcg, taken orally or inserted vaginally 2 to 3 hours prior to hysteroscopy.

Prevention of infection — Povidone iodine solution is typically used for sterile vaginal preparation. Routine prophylactic antibiotics are not required as infection rate post hysteroscopy have been reported in less than 1 percent of women.

Pain management — Pain management is generally individualized based on needs of the patient and procedure planned. Anesthesia may be needed to limit pain and facilitate hysteroscopy.

Operative Challenges

There are many reasons which can lead to procedure failure or complications. The most common are difficult Entry and poor

visualization

Difficult Entry-

1. *Cervical stenosis* — Pre-procedure cervical ripening with misoprostol and small diameter instruments can reduce the frequency of procedure failure due to cervical stenosis. When dilation of the cervix is difficult, a flexible hysteroscope may be passed more easily than a rigid dilator or sound. Also, the direct view helps to navigate the canal. If a small dilator cannot be easily inserted, hysteroscopy can be performed under ultrasound guidance to confirm correct passage of the dilator into the endometrial cavity and make sure a false passage is not created.
2. *Uterine malposition* — Extreme uterine retroversion or anteversion may be congenital or may be due to pelvic adhesions. Such malposition may limit the ability to introduce the hysteroscope. Traction with a tenaculum on the anterior lip of the cervix will often straighten the uterine axis. Also, use of a flexible hysteroscope may be helpful. Of note, malposition may increase the risk of uterine perforation.

Poor Visualization

1. *Difficult uterine distention* — Once the cervix has been dilated, it is unusual to have difficulty instilling a distention medium. If this difficulty is encountered, it is likely that there is an obstruction in the uterine cavity (eg, synechiae, malignancy) or a false tract may have been created during cervical dilation or hysteroscope insertion.
2. *Obscuring blood* — Bleeding can impair visualization. For fluid media procedures, use of a continuous flow hysteroscope allows lavage of the endometrial cavity.

Complications and Management

Complications from hysteroscopy are rare, but some are potentially life threatening.

A multicenter study of 92 centers and over 21,000 operative hysteroscopic procedures reported a complication rate of 0.22 percent. The most common complication was perforation of the uterus (0.12%), followed by fluid overload (0.06 %), intraoperative hemorrhage (0.03 %), bladder or bowel injury (0.02 %), and endomyometritis (0.01 %)[2].

Uterine perforation — uterine perforation is the most common complication of hysteroscopy. A uterine perforation can occur during mechanical dilation with dilator or during the insertion of the hysteroscope. It is usually diagnosed when an instrument passes beyond the expected uterocervical length or if the vision is suddenly lost due to failure of distension of uterine cavity or intra-abdominal structures like omentum or bowel is seen. The management depends upon size, method, site and risk of injury to adjacent organs. Perforation by a smaller dilator or thin diagnostic sheath can be managed conservatively by observation and antibiotics. However if larger instruments or electrosurgical energy have been used, it can lead to more serious injuries including intestinal injuries. If anything like this is suspected, it is better to evaluate the abdominal cavity with laparoscopy.

Excessive fluid absorption — Excessive fluid absorption is the second most complication reported. Serious life threatening complications have been reported following excessive fluid overload. Careful assessment should be done during the surgery for preventing the overload. Following are the important steps for prevention:

Prevention of fluid overload —

- Use isoosmolar, electrolyte rich fluids whenever possible.
- Limit the amount of preoperative intravenous fluids.
- Advise anesthesia to minimize intra-operative fluids, especially when large myomas or deep hysteroscopic resection is anticipated.
- Monitor fluid deficit closely and halt the procedure and evaluate for fluid-related complications at pre-set thresholds
- Maintain the lowest intrauterine fluid pressure to achieve excellent visualization[3].
- Limit surgical time.

Diagnosis and management of fluid overload

Definition of fluid overload- A fluid deficit of more than 1000 ml should be used as threshold to define fluid overload when using hypotonic solutions and 2500 ml when using isotonic solutions in healthy women of reproductive age.

In elderly or women with co morbid conditions such as cardiovascular disease and renal impairment lower thresholds apply and it is suggested that upper fluid deficit levels of 750

ml for hypotonic and 1500 ml for isotonic solutions.

During the surgery, at any stage if it appears that the fluid deficit has been reached, the surgical team should pause and assess patient status. After estimating the amount of time necessary to complete the procedure, the team should either expedite the completion of the procedure or terminate the procedure.

If a criterion for stopping a procedure is met, the following steps should be taken to evaluate the patient:

(1) Stop procedure – Discontinue fluid inflow and remove all instruments. If there is active bleeding, insert foley catheter in the uterine cavity and inflate the balloon. The catheter can be removed after six to eight hours if the patient is hemodynamically stable and bleeding has stopped. Overdistension of the intrauterine cavity should be avoided to minimize the risk of uterine rupture.

(2) Evaluate hemodynamic status and check for symptoms of volume overload, hyponatremia, or glycine toxicity (in patients who are not under sedation or general anesthesia) – Nausea, headache, visual disturbance, prickling or burning sensation in the face and neck, chest pain, shortness of breath. If present, rapidly administer IV Lasix for fluid overload and monitor urine output for diuresis.

(3) Evaluate mental, respiratory, and cardiovascular status.

(4) Check Hematocrit, platelets, blood urea nitrogen, creatinine, sodium, potassium, bicarbonate, chloride, glucose, ammonia and plasma osmolality.

Patients who have an excessive fluid deficit but show no signs or symptoms of fluid overload can be observed, but this observation must be continued postoperatively.

Depending on the degree of fluid overload or electrolyte imbalance, management may include observation, diuresis, intravenous administration of corrective fluids (eg, hypertonic saline), or hemodialysis. Consultation with a nephrologist or cardiologist, or transfer of the patient to a critical care setting, may be necessary.

Cervical laceration — cervical lacerations can occur, particularly in women with cervical stenosis. Lacerations that are large or are bleeding may require sutures.

Embolism — Embolism (air or carbon dioxide) can occur with any hysteroscopic technique and can cause cardiovascular collapse. If gas embolism is suspected, the procedure should be terminated immediately, the uterus deflated, and sources of fluid or gas removed[4].

Supportive care (eg, the use of mechanical ventilation, vasopressors, volume resuscitation as indicated) is the cornerstone of management. The patient should be shifted to intensive care unit.

Electrosurgical injury — Thermal effects of radiofrequency or laser energy can cause injuries to the uterine cavity, as well as bowel, urinary bladder, and large pelvic vessels. In particular, a significant risk of bowel injury has been reported from hysteroscopic coagulation of the tubal cornua for sterilization. One must be cautious if coagulating in the tubal recesses.

Infection — The risk of infection after operative hysteroscopy is low. Studies of 2000 or more procedures report postoperative incidences of 0.1 to 0.9 percent incidences for endometritis and 0.6 percent for urinary tract infections.

Conclusion-Although Hysteroscopy is a safe, highly effective and minimally invasive procedure. The complications can lead can be life threatening. Because most of the patients undergoing hysteroscopy are young healthy females, it becomes even more important to be extra cautious and prevent all possible complications. Proper technique, good training and knowledge of complications and their management can prevent most of the adverse outcomes..

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Hysteroscopy In Infertility –The current evidence

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Introduction

The International Committee for Monitoring Assisted Reproductive Technology (ICMART) and the World Health Organization (WHO) define infertility as failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse. The basic evaluation of the infertile couple includes tests of ovulation and tubal patency, either by hysterosalpingography (HSG) / sonohysterography (SSG), or transvaginal sonography (TVS) and semen analysis for the male partner.

Intrauterine lesions are more common in infertile women, any abnormality in the uterine cavity decreases spontaneous fertility as well as impairs Implantation rates in assisted reproduction in 10-15% of cases and 50% in cases of recurrent Implantation Failure[1]. Hence it is important to evaluate endometrial cavity. Ultrasound (USG) or HSG are considered as the primary diagnostic tools for uterine cavity abnormalities.

2 'D' Ultrasound has 84.5% sensitivity, 98.7% specificity, 98% positive predictive value and 89.2% negative predictive value[2] but its accuracy is limited in diagnosing congenital uterine malformations, distinguishing submucosal fibroids in the presence of multiple fibroids and large polyps from hyperplasic endometrium. HSG results are cycle dependent and results may vary during different days of cycle and different phases of the menstrual cycle, due to the variable growth of the endometrium. Menstrual debris, Mucus and air bubble may mimic filling defects, and thus obliterate shadows caused by small endometrial lesions[3].

Abnormalities in approximately one-third of the patients are reported as normal on HSG and/ or Ultrasound, they may actually give false reassurance and may lead to failure of conception.

Hysteroscopy has evolved over years from direct visualization and diagnosing uterine cavity abnormalities to simultaneously diagnose and treat a multitude of intrauterine pathologies, hence is considered as the gold standard technique for uterine factor evaluation unlike the other indirect and purely diagnostic techniques, i.e. TVS, HSG and SSG. Nevertheless, the use of hysteroscopy as a routine procedure in the infertility work-up is still under debate and it is unclear at which specific step of the infertility work-up (e.g. at initial assessment as a routine in all infertile couple, prior to IUI, prior to first IVF/ICSI, when an intrauterine abnormality is suspected by non-invasive methods, or after one or more failed IVF/ICSI, etc.) hysteroscopy should be performed in order to maximize its beneficial effects on reproductive outcomes. These are discussed below.

1. Hysteroscopy as a routine in the Fertility workup in women with unexplained subfertility, who are trying to conceive spontaneously when ultrasound and HSG are normal.

   A recent systematic review of Cochrane Database by Kamath et al[4] included single RCT of 200 women with unexplained infertility of 2 years of duration, where 100 women were subjected to hysteroscopy vs no intervention in 100 women, clinical pregnancy rate (RR: 3.80, 95% CI: 2.31–6.24), miscarriage rate (RR: 2.80, 95% CI: 1.05–7.48) and the adverse effects were not statically different in both the groups. Thus there is no evidence for supporting routine hysteroscopy in primary fertility work-up of women with normal TVS or sono hysterography, very low-quality evidence.

2. Role of Screening Hysteroscopy in unexplained infertility undergoing IUI or before first IVF/ICSI when ultrasound and HSG are normal. Hysteroscopy as a routine before IVF /ICSI increased the chances for a clinical pregnancy between 33 and 40% assuming

28% clinical pregnancy rate, relative risk 1.32 (95% CI: 1.20–1.45;), miscarriage rate (RR: 1.01, 95% CI: 0.67–1.50), both were not statistically different,low-quality evidence (systematic review of Cochrane Database by Kamath et al[4] . In summary, there is no robust, high-quality evidence from 10 RCTs in 3,750 women that routine hysteroscopy before IVF/ICSI for various medical indications may offer a benefit for the outcomes of live birth or clinical pregnancy rate.

3. Hysteroscopies in Intrauterine pathologies

Intrauterine abnormalities like endometrial polyps, submucous fibroids, uterine septa, or intrauterine adhesions are detected by hysteroscopy in 10 to 15% of infertile women seeking treatment. It's always a persistent dilemma -Should all Intrauterine pathologies always be removed in couples trying to conceive?

Submucus Myomas

The incidence of submucosal myomas (figure 1)

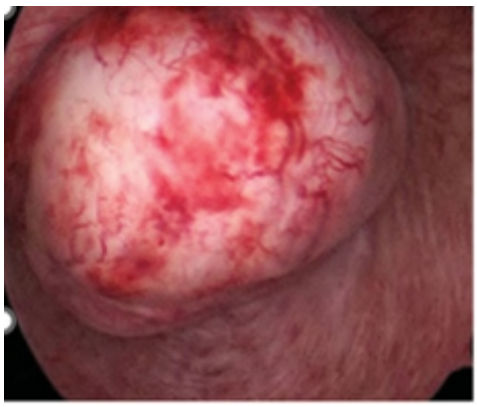

Figure 1: Hysteroscopy showing submucus myoma

associated with infertility is estimated between 5% and 10%. A meta-analysis by Pritts et al[5] reported that submucous myomas are associated with lower implantation rates and increased risk for pregnancy loss. However Cochrane review[6] didn't show any clear benefits regarding operative myomectomy specially in couples with unexplained infertility trying to conceive normally with regular sexual intercourse (single RCT of 94 , pregnancy (OR (odds ratio) 2.44, 95% CI (confidence interval) 0.97 to 6.17~ p = 0.06) and miscarriage rates (OR 1.54, 95% CI 0.47 to 5.00~ p = 0.47) low quality evidence.

Nevertheless, according to the Practice Committee of the American Society for Reproductive Medicine (ASRM) and the updated French guidelines, in asymptomatic women with cavity-distorting myomas (intramural with a submucosal component or submucosal) and desire of pregnancy, myomectomy may be considered to improve pregnancy rates and reproductive outcomes.

Endometrial Polyps

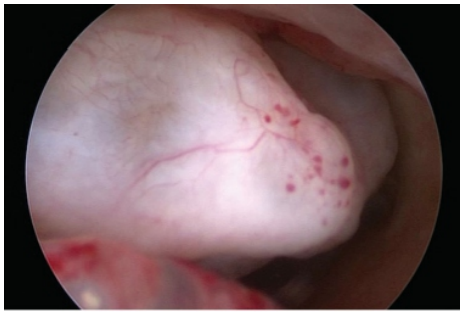

Figure 2: Endometrial Polyp

Perez-Medina et al[7] prospective study evaluating 204 women with 101 women underwent polypectomy prior to IUI, hysteroscopic removal of polyps (figure 2) showed a significant improvement in clinical PR (27). 65% of the study group achieved pregnancy before undergoing an intrauterine insemination cycle.

Uterine Septum

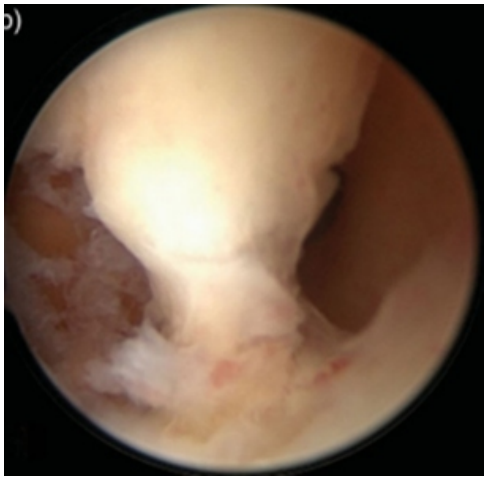

Figure 3: Uterine septum

'Of all the congenital anomalies, septate uterus (figure 3) is the most common uterine malformation, 0.2 to 2.3% of reproductive age women. Non-randomized prospective trials have shown that uterine septum is associated with 47% lower implantation rate and a 67% chance of miscarriage. Multiple observational studies indicate that hysteroscopic septum incision is associated with improved reproductive outcome. The uterine cavity is healed by approximately 8 weeks after hysteroscopic septum incision and this period seems to be appropriate for a woman to wait to conceive.

At present, the hysteroscopic resection is recommended by the American Society of Reproductive Medicine (ASRM) guidelines. Conversely, the European Society of Human Reproduction and Embryology (ESHRE), the National Institute for Health and Care Excellence (NICE) and the Royal College of Obstetricians and Gynaecologists (RCOG) do not support the routine use of this procedure.

Uterine Synechiae

Hysteroscopy represents the better technique for their evaluation, allowing the direct visualization of position, extent, and morphology of the adhesion. Hysteroscopic adhesiolysis has been shown to improve fertility rate and conception percentage by up to 48%.

Chronic Endometritis

The data on the clinical significance and implications for treatment of chronic endometritis is currently inconclusive, but there is some evidence that diagnosis and treatment based on hysteroscopy may improve outcomes in infertile patients.

Though the Cochrane data is inconclusive about operative hysteroscopy there is enough evidence in the multiple observational studies indicating improved clinical pregnancy rates in those women who undergoing operative hysteroscopy before an IVF cycle and thus examination of uterine cavity is a good practice point for the management of infertile women with a diagnosis of intrauterine abnormalities by ultrasound scan.

Should Hysteroscopy be a routine before Recurrent Implantation Failures?

Moderate quality of evidence has proven the beneficial effect of hysteroscopy for women experiencing one or more implantation failures after IVF/ICSI. Benefits of hysteroscopy extend beyond the treatment of intrauterine abnormalities. The distending media like saline may remove anti-adhesive glycoprotein molecules on the endometrium [i.e. cyclooxygenase-2 (COX-2), mucin-1 (MUC-1) and integrin aVb3], These molecules play an important role in endometrial receptivity. Cervical dilation during pre-IVF hysteroscopy may facilitate easy entry of embryo catheter and thus may possibly improve implantation rate. Few authors have also proposed the beneficial role of endometrial scratching. The inflammatory reaction generated after endometrial scratch releases cytokines and growth factors required for implantation, such as glycodelin A,laminin alpha-4, integrin alpha-6 and matrix metalloproteinase-1 and thus enhances the endometrial receptivity thus improving clinical pregnancy rate after IVF.

However, it is to be kept in mind that hysteroscopy requires general anesthesia, the operating room setting, skill of the surgeon and there is considerable cost involved in doing the procedure. Use of distention media composed of low osmolality and electrolyte-free for operative work, requires careful surveillance of fluid status to minimize complications due to fluid overload. These requirements may prohibit surgeons from considering hysteroscopy as a first-line test.

The National Institute for Health and Clinical Excellence (NICE guidelines, 2014) stated that hysteroscopy should not be offered during the initial infertility evaluation; as the effectiveness of this procedure as a routine in improving reproductive outcome has not been established.

On the other hand, according to the Practice Committee of the American Society for Reproductive Medicine (ASRM), hysteroscopy is a relatively expensive and invasive procedure. World Health Organization (WHO) recommends hysteroscopy when either clinical or diagnostic modalities like ultrasound or hysterosalpingogram (HSG) suggest intrauterine abnormality or after in vitro fertilization (IVF).

In contrast, the guidelines of the Italian Society of Gynaecological Endoscopy (SEGI), strictly recommend hysteroscopy as a screening

procedure for the infertile couple as part of the primary work-up More profound emphasis is in patients undergoing in vitro fertilization/ intracytoplasmic sperm injection (IVF/ICSI) and recurrent miscarriages even if specific evidence of its usefulness in these cases is lacking.

Office Hysteroscopy

Office hysteroscopy is strongly emerging as minimal invasive procedure allowing therapeutic procedure to be done in the same sitting. The use of office vaginoscopy hysteroscopy without a speculum and cervical tenaculum allows examination without the need for anesthesia and premedication. Vaginoscopy hysteroscopy is associated not only with minimal patient discomfort, but also with excellent visualization, and very low complication and failure rates (2% vs 5% with traditional hysteroscopes. The technological advances in terms of smaller diameters of the hysteroscope (2.9 mm vs 4 mm in traditional hysteroscope), better optical vision, decreased failure rate due to smaller diameter has made it a well-accepted procedure however it has its own limitations, it requires sufficient pretraining and good expertise with the traditional hysteroscopes proper skills and expertise , increased maintenance cost as they are more delicate wear out more easily, increased pain and discomfort makes the operative procedure little difficult , the visibility and distention is poor in patulous external os, and the visibility is poor in thickened endometrium, and the presence of blood inside the uterine cavity. for its diagnostic and therapeutic capacity of reliable the main intracavitary anomalies.

Conclusion

"…the womb is the field of generation; and if this field be corrupted it is in vain to expect any fruit though it be ever so well sown." Aristotle.

It is very important to have a healthy endometrial cavity for embryo to implant. Considering the cost effectiveness, routine hysteroscopy in all infertile women with unexplained infertility with normal USG and HSG/SSG findings and before first IVF is not routinely recommended. It's a good practice point that patients with intrauterine pathologies should be individualized, counselled and decision should be taken after individualizing the benefits and adverse effects for the procedure. Patients with Recurrent Implantation Failure should be considered for hysteroscopy as uterine pathologies are seen in as high as 50% of these cases. Currently, the validity of the NICE guideline still holds: "Women should not be offered hysteroscopy on its own as part of the initial investigation unless clinically indicated because the effectiveness of surgical treatment of uterine abnormalities on improving pregnancy rates has not been established.". Large RCT's and metanalysis are needed to assess the effectiveness of Hysteroscopy in infertile cases.

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Declaration –

Images are taken from the below mentioned article.

Georgi Stamenov Stamenov, Salvatore Giovanni Vitale, Luigi Della Corte, George Angelos Vilos, Dimitar Angelov Parvanov, Dragomira Nikolaeva Nikolova, Rumiana Rumenova Ganeva & Sergio Haimovich (2022) Hysteroscopy and female infertility: a fresh look to a busy corner, Human Fertility, 25:3, 430-446

Impact of Impact Factors

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Introduction

Eugene Garfield (founder, Institute for Scientific Information (ISI), Philadelphia) & Irving Sher created Journal Impact Factor (JIF). ISI was acquired by Thomson Scientific & Healthcare in 1992, earlier known as Thomson ISI, now renamed Web of Science (WOS). Presently, Clarivate Analytics manages Journal Citation Reports (JCR) & owns WOS. Impact factors (IF) were calculated yearly starting from 1975 for journals listed in the JCR. JIF is published not only by Clarivate but also by other indexing agencies e.g. Scopus and publishers for their owned journals.

Why Calculate Impact Factors?

1. Evaluate the scholarly worth of journal.
2. Rank journals within a discipline.
3. Publications in journals with high JIF are determinants at evaluation for promotions & grants.
4. Remove bias which favor larger journals over small ones, of older journals over newer ones or of frequently issued journals over those less frequently issued.
5. Helps to decide where to publish for maximum impact.

Journal Impact factor

Average frequency with which articles from a journal are used as citations in other journals during previous two years (Clarivate/Web of Science)

Includes a two year window of citable documents (see calculation below) i.e. articles and reviews

How is JIF calculated?

$$\frac{\text{Total number of times its articles were cited during the two previous years}}{\text{Total number of citable articles in the journal during those two years}} = \text{Journal Impact Factor}$$

e.g. Cites in 2008 to items published in 2007=200 Number of items published in 2007= 55

2006=300	2006= 49
Sum = 500	Sum = 104

JIF : 500/104= 4.80

Scopus: Uses the term Citescore for journal impact factor.

Unlike JIF, four year window including all documents indexed by Scopus ie articles, reviews, letters etc are used for calculating Citescore.

Examples of other databases for journal indexing are Scimago, EigenFactor, Copernicus. Publishers often advertise their journal index factor on their websites and publicity fliers (e.g. http://www.elsevier.com/locate/oraloncology)

Determinants of JIF

1. English language journals are favored in JCR & have higher IF than non-English language journals.
2. Large correspondence section or controversial editorials, poor papers which can result in higher citations. However, increase in citable items can have opposite effect e.g., in 1997, the Lancet divided its 'Letters' section into 'Correspondence' and 'Research Letters' — the latter being peer-reviewed and hence 'citable' for the denominator, the increase in the denominator led to reduction in IF from 17 to 12
3. Self-citations can fallaciously increase journal IF.
4. Open versus subscription-based access; open access would certainly increase the IF.
5. Language/ geographical location, English being the most common language.
6. The scientific field to which the journal belongs, scientific journals generally rank higher than clinical journals.
7. Errors, misprints, and inconsistencies in citations may bring down the IF.
8. IFs are biased toward journals that publish review articles.
9. Change in title of a well-established journal may adversely affect IF since the earlier citations would not be related to the new title.

Its important to know that books and chapters are not scanned for their bibliographies or included in any IF calculation.

Contentious uses of Journal Impact Factor

- Used to determine Author Impact & compare institutions.
- Researchers have started to look for journals with the highest IFs instead of journals with the best audience for publishing their research.
- Skewedness impacts JIF e.g. Nature citations in 2004 of papers published in 2002 to 2003.

89% of impact factor was generated by just 25% of their papers - most cited was the mouse genome.

Author impact factor

- It is the metrics of individual impact i.e. quantitative estimates of relative importance of a scientist.
- AIF are cumulative i.e. combine all the works done by a scientist during his/her whole research career. It is known that research productivity and impact vary with time.
- Distribution of the number of citations is generally skewed, with some papers being poorly cited and a few being highly cited.
- Popular sites for AIF are ResearchGate, Google Scholar, Web of Science, Semantic Scholar, Dimensions.

Altmetrics (Flowchart 1) for author impact factor

- It is the alternative metrics of individual impact based on Social Web for analyzing the impact of publication
- Alternative metrics consider online reader behavior, network interactions, and social media.
- It is meant to complement, not completely replace, traditional impact measures.

Few applications and websites which calculate author altmetrics are Altmetric for Scopus and ImpactStory, PLOS One.

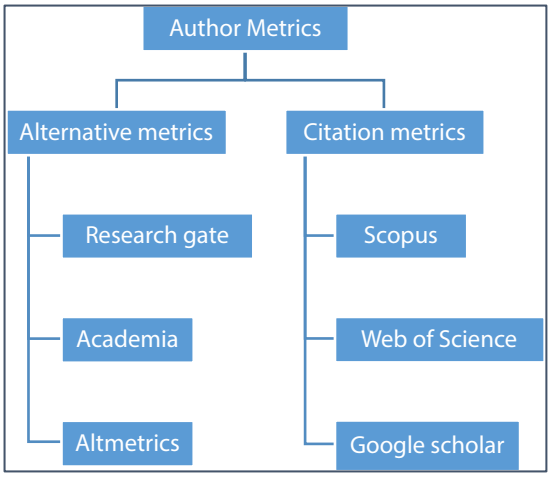
Google Scholar

- Google Scholar Citations can be used to create own profile for list of publications, citations, and h-index
- H-index is calculated by counting the number of publications for which an author has been cited at least the same number of time e.g. H-index of 17 means that the scientist has published at least 17 papers that have each been cited at least 17 times, number of publications = number of times cited

Useful take home points

- Open access improves visibility & access to the article.
- Invitation for articles in special journal issues with theme offer good opportunities for submission.
- Ranking in JCR, SJR, WOS, DOAJ helps to identify predatory journals.
- Presently, impact factor of journal continues to determine the choice of journal for publication.
- Choice of journal should be based on its readership, mandate, processing charges & the impact factor.
- Known as an Open Researcher and Contributor ID (ORCID ID), ORCID is a 16-digit alphanumeric code used to identify authors and contributors to scholarly communication. Across disciplines, organizations, and time, it connects professionals and their contributions. Research contributions and innovations are better recognized through ORCID thereby improving the visibility, cross references and thereby improving the AIF.

Flowchart 1 : Options for Author Impact Factors today



Shockvertising' – Do the ends justify the means?

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'"A particular social media celebrity has died of cervical cancer at quite a young age". That is how the news viral on social media, broke to me, incidentally through a social media message by one of my educators. "This shows the importance of HPV vaccination", the follow-up message by my senior read.

The age cited in the message was very young, the particular named celebrity had been known to earlier have resorted to sensationalist doings to hit the news, and so it was a bit incredulous to take the breaking news at face value. A quick scan of the mainstream media in fact showed not much had been covered about this, in our otherwise celebrity related news hungry media. However, social media was abuzz with the news, with the name of the celebrity trending among the top topics of discussion at national level, over Twitter platform, now known as 'X'. As doubtful as the situation was, it still had to be given some benefit of doubt, as it was really difficult to believe that someone sane will spread sham news about one's own demise. There have been instances galore where falsehoods about the death of a (usually ailing) celebrity suddenly start spreading over social media, but these hoaxes are started and spread by anonymous others, not by the people involved themselves. In this instance, the news had come from someone from the personality's own circle apparently.

The news reminds of an occurrence more than a decade back. Jade Goody, a reality television star in England had a controversial season on an English reality show in 2007 that also starred an Indian celebrity actress. In the latter half of the next year 2008, she came to participate in the Indian version of the same reality show, incidentally hosted by the same Indian actress who was her earlier co-participant. She apparently learnt of her cervical cancer diagnosis while shooting for the Indian show, and immediately left the show to return back home. At that time, there were murmurs that this health related news was just a publicity stunt. However, unfortunately in her case, it was indeed a medical diagnosis in reality. The cancer spread despite all treatment, and just months after leaving from India, Ms. Goody lost her life to cervical cancer, tragically at the very young age of 27 years.

A peer reviewed article in 2013 in the British Journal of Cancer, a part of the Nature group, reported that there was a 12% increase in the number of cervical cytology samples performed in 2008-09 and a 10% increase in referrals to colposcopy in the country following Goody's diagnosis and death. The article dubbed this the 'Jade Goody effect', that her illness was well covered by all forms of media, bringing cervical cancer into the public consciousness[1].

While these thoughts and the poignancy of the earlier story was still going on in my mind, the next day the lady celebrity in question, herself released a video stating that the entire news of her staged demise had been a planned stunt to promote awareness about the disease. Despite her intention to spread awareness, the stunt has been widely criticized over social media, and is still facing a lot of social media angst as of the time of writing this. A couple of days after the reveal of the stunt, the news also broke that it was not an act planned by the celebrity or her team alone, a professional digital advertising agency was involved in conceptualizing the 'cervical cancer awareness' and executing it in collaboration with a media company[2,3]. The company while extending apology for anyone who may have been 'triggered' by the news, went on to mention in their public released statement, that the "act" resulted in making cervical cancer and similar terms the most

searched topics on Google. According to the company, "this is the first time in the history of this country that the word 'cervical cancer' has been on over 1000 headlines". Creating some more social media furor even in the statement of their apology, the marketing company claimed that searches about 'cervical cancer' did not increase even after being mentioned in the Union Budget by the honorable Finance Minister of India, but increased manifold after their organized act the next day. The agency included screenshots from Google search trends in India as a part of their statement released via social media, to back up their claims! [2,3]

In the entire episode, which quite frankly is difficult to come to terms with, it has come about that there is apparently a term for this – 'shockvertising'. Shock advertising or shockvertising is defined as an attempt to 'surprise an audience by deliberately violating norms for societal values and personal ideals, to capture the attention of a target audience'. However, there are contrasting views on shock advertising, as some view it as a creative technique, whereas others criticize it as gimmicky and attention grabbing[4].

So a professionally planned and executed marketing promoting the faking of one's own death is just a shockvertising campaign. Debates are still raging on social media on the ethics and decorum of it all, and whether the ends justify the means. Another interesting question to ponder can be that what actually was the actual subject of promotion – sensitization about the disease, or trending the social media celebrity. Revisiting the title of the article, do the ends justify the means in 'shockvertising' – maybe a byline to this can be that 'and by the way, what is the primary end being served'.

Dust will soon settle on this entire episode, and social media warriors will move on to the next absurdity or 'creative brilliance' depending on the way you see it. Public memory is notably fickle, and social media by its very nature requires a new 'buzz' at regular intervals to keep the buzz going. But the health professionals need to gamely go on fighting the public health battle against this silent killer of many a human. There is a saying in advertising and marketing that any publicity is good publicity. From what could be researched from publicly available tools regarding Google searches, the search for the term 'cervical cancer' did in fact breakout and surge over the days this was going on. However, the same graphs show that the search velocity equally rapidly subsided in a couple of days. How much of a long term effect, if any, would unsolicited campaigns like these do for the public health topic of interest, remains a question to be unanswered. The 'Jade Goody effect' previously cited in literature sets the argument that it does1. It has been observed that studies so far have identified shockvertising as a valid strategy to capture attention[4].

Harmony and happiness are difficult things to achieve in the churning vats of social media discussions. Whether and if some good for 'health' can be achieved through the disharmony and ephemerality of social media sensationalism, is a harmonious food for thought to leave the readers with.

References:

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Untargeted metabolomics analysis reveals the metabolic disturbances and exacerbation of oxidative stress in recurrent spontaneous abortion

Wu A, Zhao Y, Yu R, Zhou J, Tuo Y.

PLoS One. 2023 Dec 21;18(12):e0296122.

Abstract

Background: Recurrent spontaneous abortion (RSA) is characterized by the occurrence of two or more consecutive spontaneous abortions, with a rising prevalence among pregnant women and significant implications for their physical and mental well-being. The multifaceted etiology of RSA has posed challenges in unraveling the molecular mechanisms underlying that underlie its pathogenesis. Oxidative stress and immune response have been identified as pivotal factors in the development of its condition.

Methods: Eleven serum samples from healthy pregnant women and 17 from RSA were subjected to liquid chromatography/mass spectrometry (LC-MS) analysis. Multivariate statistical analysis was employed to excavate system-level characterization of the serum metabolome. The measurement of seven oxidative stress products, namely superoxide dismutase (SOD), catalase (CAT), malonaldehyde (MDA), glutathione (GPx), glutathione peroxidase (GSH), oxidized glutathione (GSSG), heme oxygenase (HO-1), was carried out using ELISA.

Results: Through the monitoring of metabolic and lipid alternations during RSA events, we have identified 816 biomarkers that were implicated in various metabolic pathways, including glutathione metabolism, phosphonate and phosphinate metabolism, nucleotide metabolism, sphingolipid metabolism, lysine degradation and purine metabolism, etc. These pathways have been found to be closely associated with the progression of the disease. Our finding indicated that the levels of MDA and HO-1 were elevated in the RSA group compared to the control group, whereas SOD, CAT and GPx exhibited a contrary pattern. However, no slight difference was observed in GSH and GSSG levels between the RSA group and the control group.

Conclusion: The manifestation of RSA elicited discernible temporal alternations in the serum metabolome and biochemical markers linked to the metabolic pathways of oxidative stress and immune response. Our investigation furnished a more comprehensive analytical framework encompassing metabolites and enzymes associated with oxidative stress. This inquiry furnished a more nuanced comprehension of the pathogenesis of RSA and established the ground work for prognostication and prophylaxis.

AUTHOR'S COMMENT

Recurrent pregnancy loss (RPL), defined as three or more consecutive pregnancy losses, affects 0.5–2% of women in childbearing age. Recent studies highlight the role of oxidative stress and oxidative biomarkers in the pathophysiology of recurrent pregnancy loss. In the mitochondrial matrix O2 is reduced into H2O by the respiratory chain and will generate highly reactive molecules known as reactive oxygen species (ROS]. The most important ROS derived from enzymatic and by a non-enzymatic reaction is superoxide anion. Superoxide anion is rapidly dismutated to H2O2. Hydrogen peroxide (H2O2) is further degraded to O2 and H2O by antioxidant enzymes as catalase (CAT) and glutathione peroxidase (GPx). Reduced glutathione (GSH) acts as peroxide scavenger and its oxidised form (GSSG) can be further reduced by glutathione reductase (GR) using NADPH as substrate. The oxidative stress is a consequence of excessive ROS production, reduced antioxidant capacity and mitochondrial dysfunction . When oxidative stress (OS) occurs, macromolecular homeostasis can be substantially affected

because of lipid peroxidation, protein modifications and DNA oxidation by free radicals. Oxidative biomarkers are important tool in measuring oxidative stress in clinical samples in RPL. Common biomarkers measured in oxidative stress research include hydrogen peroxide (H2O2), hydroxyl radicals (OH"), peroxyl radicals, malondialdehyde (MDA) as a marker of ROS-mediated damage of membrane lipids, 8-hydroxyguanosine (8-OHG) as a RNA damage product and 8-hydroxydeoxyguanosine (8-OHdG) as a biomarker of oxidative DNA damage, Superoxide anion radical (SOA). Importantly, increased levels of SOA and H2O2 were associated with depletion of enzymatic antioxidants such as superoxide dismutase (SOD) catalase (CAT), glutathione reductase (GR) and glutathione peroxidase (GPx) as well as decreased expression of all examined antioxidant genes (GPx, GR, SOD and CAT). Herefore, antioxidant defense system involves enzymatic and non-enzymatic agents. Endogenous enzymatic antioxidants are the first line of defense and include matrix manganese superoxide dismutase (MnSOD, intermembrane cooper/ zinc superoxide dismutase (Cu/ZnSOD), glutathione reductase (GR), glutathione peroxidase (GPx), and catalase (CAT). Ceruloplasmin, transferrin, ferritin and albumin are non-enzymatic antioxidants in the blood plasma . Natural non-enzymatic antioxidants are represented by vitamin A, vitamin E, vitamin C, Micronutrients selenium (Se), zinc (Zn), cooper (Cu) and manganese (Mn) are cofactors for the enzymatic antioxidants ,polyphenols, uric acid, flavonoids, carotenoids, glutathione, bilirubin and melatonin, metallothione, At the end of first trimester, establishment of maternal circulation is associated with burst of oxidative stress even in normal pregnancy and has important role in normal placentation . Increased oxygen concentration and diminished antioxidant capacity will result in impaired or abnormal placentation and early pregnancy failure. Cochrane database systematic review on effectiveness and safety of any vitamin supplementation on the risk of miscarriage, found that antioxidant vitamin supplementation had no effect on early or late miscarriage. Albeit, the currently available studies support the concept that oxidative stress and OS-mediated damage is implicated as an essential factor in the etiology of RPL, exact mechanisms of this interaction remains largely indefinable. Therefore, future research in this field can provide new insights regarding the potential applications of antioxidant therapy and their role in the prevention and treatment of pregnancy complications and recurrent pregnancy loss.

Role of hysteroscopy in evaluation of recurrent pregnancy loss

Labib NS, MohesenMN, SaLem SA, et al.

International Journal of Health Sciences 2022; 6(S1), 13983–13993.

Abstract

Objective: to detect the uterine abnormalities missed in U/S scan and HSG using hysteroscopy, in females presenting with recurrent pregnancy loss &to study hysteroscopic therapuatic potential to that pathology.

Methodology: Prospective cohort study, conducted in obstetrics & gynecology department of, Beni-suef University Hospital. One hundred women with recurrent 1st &2nd trimester pregnancy loss recruited for hysteroscopy. A rigid fiberoptic 2.7mm, 0 and 30 degrees angled hysteroscopy along with an operative channel for grasping forceps or scissors were used for both diagnostic and operative indications. The findings, and different types of abnormalities, comparison between3 cosecutive miscarriage as regarding hysteroscopic findings &impact of the procedure on management were recorded.

Results: In this study In the normal hysteroscopy group, 24 women (29.3%) achieved a successful ongoing pregnancy without additional treatment, 49 (59.8%) had recurrent miscarriages again, and 4(5%) had persistent secondary infertility . In women who needed and had hysteroscopic correction of a SUA, the number of successful ongoing pregnancies was significantly higher 13 (72.2%) vs (29.3%) in

normal group and the number of new abortions significantly was lower than in those who had no pathology 3(16.7%)vs (59.8%) with statistically significance between the 2 groups (p value = 0.002).

Conclusion: It is observed that thin adhesions, polyps and small sub mucosal myomas that are not diagnosed by HSG or U/S can be diagnosed by hysteroscopy. And fine synechia were the most common abnormality detected in (7%) of the patients, 72..2% of patients with SUAs achieved a successful ongoing pregnancy following hysteroscpic metroplasty. Hysteroscopy has much to offer in the diagnosis and treatment of SUAs.

AUTHOR'S COMMENT

The prevalence of uterine malformation is estimated to be 6.7% in the general population, slightly higher 7.3% in the infertility population, and significantly higher in a population of women with a history of recurrent miscarriages 16% . The uterine anomalies can be either congenital (i.e., Mullerian anomalies) or acquired (e.g., submucous myomas, endometrial polyps, adhesion). The management of these abnormalities using hysteroscopy as inspecting device might therefore enhancing the pregnancy either spontaneously or after specialized fertility treatment, such as intrauterine insemination or in vitro fertilization. The basic workup has included a hysterosalpingogrqphy (HSG) to evaluate the uterine cavity and tubal patency. However, HSG does not allow for simultaneous correction of uterine pathology. Moreover HSG may miss 35% of uterine abnormalities. The high false-negative rate, the low-positive predictive value, and the inability to treat abnormal findings concurrently with the diagnosis have limited the use of HSG to assess the endometrial cavity. Sonohysterography (SHG) has been proposed as better diagnostic test of the uterine cavity. However, it also suffers from a sensitivity and specificity inferior to that of hysteroscopy in most studies. Hysteroscopy is considered gold-standard in the diagnosis of uterine cavity malformations and acquired anomalies. Outpatient hysteroscopy has the advantage, although it is not available in every service .However, in case of suspected uterine malformation, hysteroscopy should be integrated with other tests [three-dimensional (3D) ultrasound or magnetic resonance imaging (MRI)] for diagnostic confirmation.

EVENTS HELD

1. AOGD actively participated in the FOGSI Run for Gender Equality, Anemia Awareness & Rh immunization on 3rd Jan 2024.

2. Under the aegis of AOGD Endometriosis, Infertility & Reproductive Endocrinology Subcommittee organised a webinar on "**Endometriosis and Infertility"** by IVF centre, Department of OBG VMMC & Safdarjung Hospital on 12th January 2024 , 2:00 - 4:00 pm.

3. AOGD and Delhi PG Forum organizing a Case discussion on **"Premalignant lesions of cervix"** on 15.01.24 at 7:00 -8:30 pm.

   Coordinator Delhi PG Forum: Dr. Sunita Malik, Dr Shivani Agarwal

   Presenters: Dr Pooja, Dr Vandana

   Moderators: Dr Bindiya Gupta, Dr Archana Misra

4. A webinar series **"Empowering Ourselves for the 90:70:90 Challenge"** was organised by Oncology Committee of AOGD, Medical Education Committee of FOGSI, Midlife Management Committee & Adolescent Committee Of FOGSI on 18th January 2024, 4:00 pm to 6:00 pm
5. Under the aegis of Medical Education Committee FOGSI in collaboration with NCD Committee FOGSI, AOGD and KOGS a webinar on **"Maternal Sepsis"** was organised on 25th January 2024 at 04:00 pm - 06:00 pm.

PROCEEDINGS OF MONTHLY CLINICAL MEETING

AOGD monthly Clinical Meeting held at Atal Bihari Vajpayee Institute of Medical Sciences & Dr. Ram Manohar Lohia Hospital, New Delhi

30th January, 2024

Optimal timing of antenatal steroid administration in preterm deliveries

Dr Vinika Nimodia, Dr Neha Mishra, Dr Kamna Datta, Dr Ashok Kumar

Background: Preterm birth is the leading cause of morbidity and mortality. All the guidelines recommend the period of gestation at which steroid cover should be given and specify the optimal steroid coverage-delivery interval. However, variations in clinical practice and steroid coverage-delivery intervals have been witnessed. So, this study aims to find out the actual practice regarding steroid coverage during the recommended time interval and the status of steroid cover-delivery interval.

Materials & Methods: This was a retrospective cohort study conducted at the Department of Obstetrics and Gynaecology, ABVIMS and Dr RML hospital, New Delhi which was approved by the Institutional Ethics Committee over a period of 2 years. Women with singleton pregnancy of gestation < 37 weeks who received antenatal corticosteroids (ACS) were included. The exclusion criteria were anomalous babies, intrauterine foetal death, and incomplete records. Injection dexamethasone 12 mg was given 12 hourly for two doses. The patients who received both doses were classified as patients receiving complete ACS whereas those receiving only 1 dose, were classified as receiving incomplete ACS.

Results: Total no. of patients included in the analysis were 150. 117 (78%) complete dexamethasone coverage and 33(22%) patients received incomplete dose. Presenting complaints was preterm labour pains in 64 (42.9%) patients. The mean POG at antenatal ACS administration was 32 weeks+5 days ± 7days. The mean POG at delivery was 33 week+2 days± 5 days. 19(63.4%) who delivered within 24 hours of ACS administration received incomplete doses. 29(19.3%) delivered >7 days of ACS administration. The mean APGAR score in patients delivered within 24 hrs-7 days of ACS administration was 6.90±1.43 (p=0.03) and mean NICU stay was 10 (7-12) days in patients who delivered after 7 days of ACS administration(p=0.01).

Conclusions: Dexamethasone should be administered only if delivery is expected within 7 days to optimize benefits in clinical practice. Overuse of corticosteroids for low-risk women must be avoided. Patients should be counselled efficiently in antenatal period and awareness should be spread among medical practitioners to timely administer dexamethasone to reduce incomplete steroid coverage

Successful pregnancy outcome in women with Severe Dilated Cardiomyopathy

Dr. Saloni Singla, Dr. Kashika Nagpal, Dr. Kanika, Dr. Indu Chawla

Background: Dilated cardiomyopathy (DCMP) is a relatively rare condition in pregnancy. Poor maternal outcome is due to increased risk of heart failure, with worsening left ventricular dilatation and dysfunction.

1st case: 37 years old female, G3P2L2 unbooked at 30 weeks and 5 days POG k/c/o DCMP in acute decompensated heart failure with NYHA class IV, WHO grade IV, CARPREG 13 with uncontrolled diabetes mellitus in cephalic presentation, not in labor. Echocardiography showed severe LV systolic dysfunction with LVEF – 15-20%. Patient was managed on oxygen, furosemide, antibiotics, digoxin, carvedilol. The patient was stabilized. However, it required intermittent oxygen at 4-6L/min due to fall in saturation. Fetal monitoring was done. Stage 1 FGR was detected. The decision to terminate pregnancy was taken at 37 weeks by cesarean section in view of DCMP

with EF- 15% with FGR. Bilateral tubal ligation was done. She delivered a male baby of 2464g. APGAR-8,9. Discharged with baby on POD10.

2nd case: 40 years, G2P0L0A1 unbooked at 32 weeks POG, k/c/o DCMP in acute decompensated heart failure with NYHA class 4, WHO grade IV, CARPREG 11, with overt diabetes mellitus uncontrolled with preeclampsia without severe features, singleton pregnancy in longitudinal lie and breech presentation, Echo showed Severe LV systolic dysfunction. LVEF – 20-25%. She went into preterm labour. LSCS was done due to DCMP with EF- 20% with breech. Baby weight 2kg Apgar 8,9. Discharged with baby on POD7

Discussion

Peripartum cardiomyopathy as opposed to dilated cardiomyopathy occurs in young previously healthy women. The mortality rate varies between 7-50% during pregnancy and labour but recovery (30-50%) usually occurs within 6 months. In patients with dilated cardiomyopathy, preconceptional counselling is very important. Risk of poor maternal outcome due to heart failure, stroke, arrhythmias. WHO advised against continuation of pregnancy in women with LVEF less than 30%. A multidisciplinary approach is required for patients who continue pregnancy. Dilated cardiomyopathy patients fare better in pregnancy than women with peripartum cardiomyopathy. The overall life expectancy of women with dilated cardiomyopathy is less.

SURVIVING PREGNANCY!

Pitfalls and Challenges –A small case series

Dr. Snigdha Sahoo, Dr. Bharti Uppal, Dr. Renuka Malik, Dr. Bangali Majhi

We present three challenging cases of pregnancy with potentially life-threatening medical disorders with successful outcomes.

Case 1:

A 30-year-old G3P2+0+0+2 at 21 weeks POG presented with complaints of breathlessness on routine activities. She was a k/c/o RHD with severe MS, severe PAH (RVsP-90mmHg) with NYHA III. Her vitals were stable. Mid diastolic murmur heard over the mitral area. Echo showed LA clot. On Cardiology consultation, PTMC was contraindicated i/v/o LA clot. The Medical Board advised for continuation of pregnancy as she was now already 24+6 POG. She continued to receive aspirin and warfarin. Repeat echo (27+6 POG) showed dissolution of clot and she underwent PTMC. At 36 weeks Tab. Aspirin was stopped and warfarin switched to LMWH. She delivered vaginally at 38 weeks. The postpartum period was uneventful and was discharged on oral anti-coagulant on D8.

Case2:

A 31-year-old G2P0+1+0+0 with 30+3 weeks presented with complaints of palpitations for 2 days. She was a k/c/o RHD with severe MR, severe PAH(RVsP-80mmHg) with NYHA-I. O/E PR – 114 bpm – irregularly irregular (atrial fibrillation), BP – 100/70 mm Hg, CVS – pan systolic murmur over mitral area. Doses of anti-arrhythmics were escalated. Tab. Aspirin and Tab. Warfarin continued. She went into spontaneous preterm labor at 31+6 weeks. Warfarin dose omitted and four FFPs transfused and taken to OT for LSCS but delivered vaginally. Postpartum was uneventful.

Case 3:

A25-year-old G2P0+1+0+0 with 27+4 weeks presented to nephrology OPD with complaints of decreased urine output and breathlessness for 7 Days. She was diagnosed with CKD-5 in early pregnancy and getting dialysis off & on. O/E PR-108 bpm, BP – 180/110 mmHg, RR – 30/min, Pallor+, Pedal edema+, Chest – B/L crepitations and rhonchi +. Diagnosis of chronic hypertension with super-imposed pre-eclampsia with fetal growth restriction was made. Doses of anti-hypertensives increased, Tab. Aspirin, Injection Erythropoietin continued. Dialysis requirements increased from once a week to thrice a week. She underwent Em. PTLSCS at 32+1 weeks i/v/o AEDF with Non-reassuring NST. In post-op period, she received twice weekly dialysis and was discharged.

Discussion:

Pulmonary hypertension is defined as a

condition of elevated mean pulmonary artery pressure e" 25 mmHg. Now, PAH is reported not only in severe MS but also in severe MR. It is associated with high obstetric risks- foetal/ neonatal mortality (30%), preterm delivery (20-30%), FGR (5-20%). Pregnancy is contraindicated in severe PAH due to high mortality rate (16-30%) most commonly due to pulmonary hypertensive crisis/ pulmonary thrombosis/ right heart failure. If a PAH patient conceives, termination should be discussed in Ist trimester itself. Pregnant PAH patient belongs to clinical class II of PAH (due to left heart disease) & should be managed by a multi-disciplinary team with great expertise in a tertiary centre. Low dose aspirin, µ§1 blockers,anti-coagulants (in AF, LA thrombosis, H/O embolism). Prognostic markers are right atrial size, RV dysfunction, pericardial effusion, high BNP levels. PTMC indicated after 20 weeks if despite medical treatment, patient NYHA III/IV & PAP e"50 mmHg. Valsalva maneuvers can lead to worsening & heart failure. So, elective Caesarean section is recommended in Severe PAH, at 34 – 36 weeks gestation.

CKD complicates 3% of pregnancies; 1 in 750 women with CKD 3-5. Pregnancy accelerates maternal renal dysfunction & advances the need for dialysis by 2.5 years.CKD patients are at risk of developing preeclampsia, preterm delivery, fetal growth restriction.Pregnancy should be postponed until renal transplantation. Since suboptimal infertility is reported in ESRD (<1%), it is not an indication of MTP as renal donors are not easily available. Optimization of BP & glycemic control should be done. The patient should be on a renal diet, low dose Aspirin, synthetic Erythropoietin & Vit. D supplementation. Quantification of proteinuria (u PCR) done to assess relative worsening in pregnancy, esp. after 20 weeks, when pre-eclampsia may develop. Dialysis is indicated when blood urea > 17 mmol/l (100 mg/dl) as high urea levels are fetotoxic & can lead to IUD. Dialysis also indicated in refractory hyperkalemia, hyperphosphatemia, acidosis or appearance of uremic symptoms (serositis/ encephalopathy). Timing of delivery based on obstetric indications & considering renal factors- deteriorating renal function, symptomatic hypoalbuminemia, pulmonary oedema or refractory hypertension.

Conclusion:

In India, pre-conceptional counselling is rare. A detailed assessment prior to conception should be carried out to assess baseline medical condition, review medications, to evaluate the need for corrective surgery and, most importantly, identify cases where pregnancy is not advisable. A close liaison between the concerned medical specialist (cardiologist/ nephrologist) and obstetrician is desirable. Also, a collaborative discussion with shared decision making for termination/ continuation of pregnancy should take place between the treating specialist, patient & her family.

FORTHCOMING EVENTS

1. AOGD Oncology Committee is organising a second webinar of series on Gearing Up for the 90:70:90 Challenge on 3rd February at 4:00pm - 6:30 pm on the occasion of World Cancer Day.
2. AOGD and Delhi PG Forum will be organizing a Case discussion on "Multiple Pregnancy" on 19.02.24 at 7:00 -8:30 pm.
3. Next AOGD monthly clinical meeting will be held online on 23rd February 2024 at 4:00 pm - 5pm and will be organized by VMMC & Safdarjung Hospital, New Delhi.
4. AOGD, South Asian Federation of Urogynecology (SAFUG) and urogynecology subcommmitte of AOGD are organising the First Annual conference of female pelvic pain association FEPPA 2024 on 20th and 21st April 2024 at Medanta Medicity, Gurugram
5. AOGD Endometriosis and Endoscopy committee organising a CME on Suturing and Knotting techniques on 3rd February 2024 at 12:00pm -4:00pm.Venue: MEU Hall, SJ Auditorium, LHMC & SSKH, New Delhi.

Highlights: In depth discussion on types of sutures and Knotting techniques with experts in the field, Hands on experience with individualized attention by mentors

Calendar of Virtual Monthly Clinical Meetings 2023-24

Date	Name of Institution
23th February, 2024	VMMC & Safdarjung Hospital
28th, March, 2024	UCMS & Guru Teg Bahadur Hospital
19th April, 2024	LHMC & Smt. Sucheta Kriplani Hospital
31st May, 2024	B L Kapoor Hospital

Award winning slogans from FOGSI slogan competition on cervical cancer prevention

PG MEDICAL STUDENT

Dr Rajguru

रोकथाम ही सबसे बेहतर उपचार,
नियमित पैप की जांच,हर महिला जो तीस के पार ।
ग्रीवा कैंसर का सबसे बेहतर उपचार,
समय पर टीका व नियमित जांच का दोहरा वार।

Dr Rahul Amitabh

Cervical cancer elimination is an achievable dream;
If vaccination, PAPS screening and early treatment is adopted by the women team

Palak Bansal

No more tears, Get a Pap Smear & keep away Cervical Cancer fear

MEDICAL PRACTITIONER

Dr Anita Gautam

एचपीवी की सुई लगे हर हाल में, उसके बाद ही बेटी जाए ससुराल में
मां बेटी पर आए ना आच समय से करवाए एचपीवी की जांच

Dr Shaily Agarwal

प्रत्येक किशोरी का अवश्य कराएं H P V टीकाकरण , सर्वाइकल कैंसर का जड़ से करें निराकारण ।

Dr Zohra Fathima

HPV causes cancer cervix and
H- HPV testing
P- Pap smear
V- vaccination
Eliminates cancer cervix..

NURSING PRACTITIONER

Major Ranjana Banik

Sehat ke liye jaagruk ho agar har naari, kabhi na pade Cervical cancer kisi pe bhaari. # Be a "Cervivor", fight Cancer.

Annoo Yadav

Forget conservatism then get vaccinated and give a cervical cacer free future for upcoming generation.

UNDERGRADUATE MEDICAL SUDENTS

Aaryan Gupta

सही समय पर टीका लें , बेटी को नव जीवन दें।
सर्वाइकल कैंसर से करे बचाव, टीकों भर का सही पड़ाव।

Ezhilarasi. M

"Aim for eradication, With cervical cancer elimination,
Let's pretreat or vaccinate, As prevention is better than the medications for its complications".

NURSING STUDENTS

Shraddha Maurya

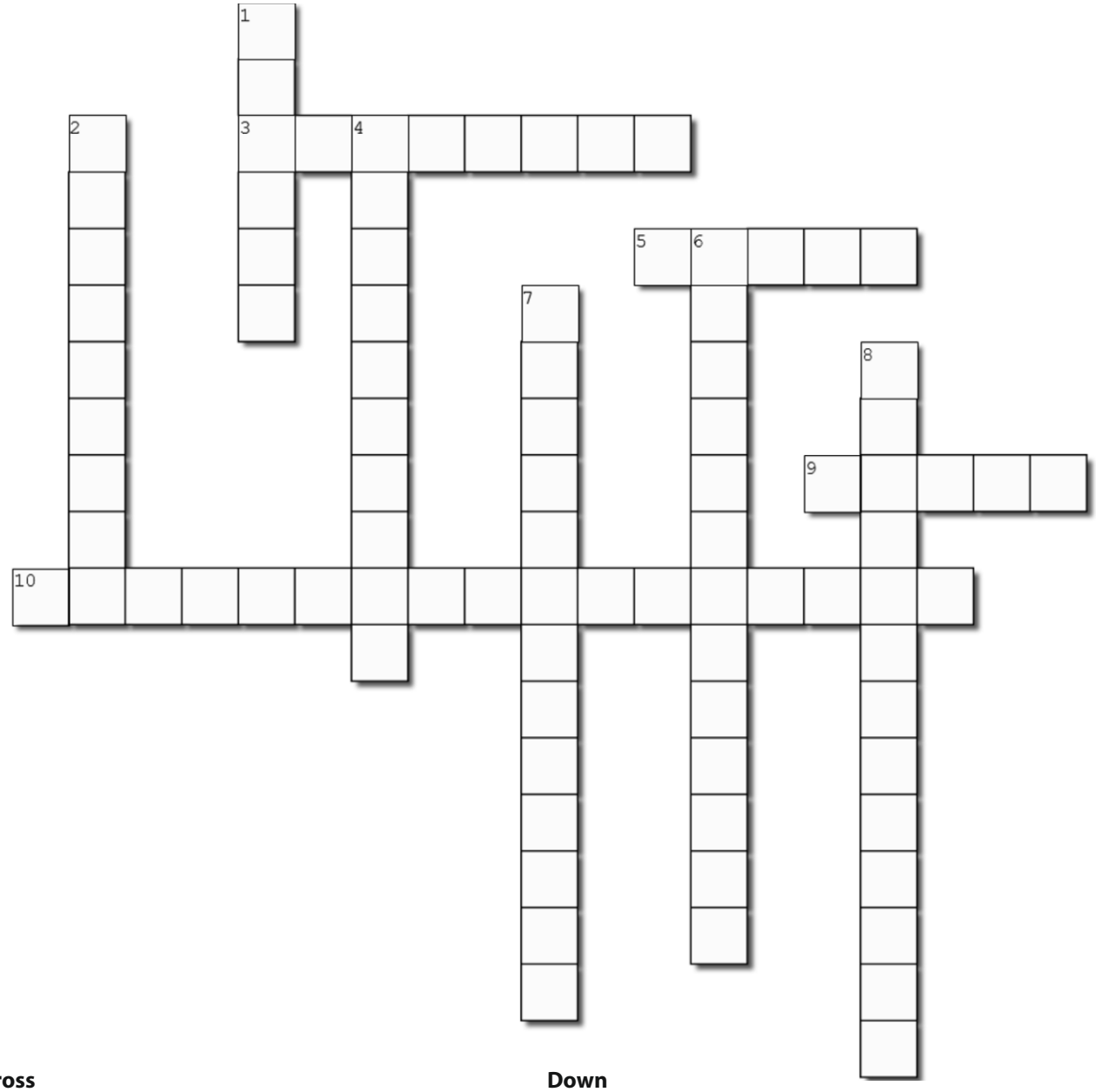
महिलाएं ना सर्मईए, अपने नजदीकि अस्पताल में HPV जाच कराइये, और सर्वाइकल कैंसर को दूर भगाईये।

Shripriya Bharadwaj

Vaccinated women can be cervical cancer free women.
Abhishek Yadav
लगवाए टीका ,भागेगा सर्वाइकल कैंसर

CROSS WORD

Bhanupriya



Across

3. Which of the following clinical signs defines progression from the warm phase of septic shock to cold phase of septic shock
5. RUSH protocol in maternal collapse include examination of (acronym)
9. Pulmonary edema occurring within 1-6 hours of blood transfusion (acronym)
10. What is done to uterus during giving chest compression to prevent aortocaval compression

Down

1. Burch colposuspension uses which ligament for repair
2. The lateral attachment for Paravaginal repair for lateral cystocele is
4. Infusion of which drug is used in the management of collapse due to intravenous injection of local anesthetic
6. Which of the following mediators of sepsis syndrome can cause myocardial deepression
7. Which is the specific marker of sepsis
8. A vessel that may be encountered during pectineal ligament preparation

Cooper, whiteline, oliguria,intrlipid,HIMAP, interleukin 6, procalcitonin, corona mortis, TRALI, Left displacement

AOGD Risk Management Support [ARMS] Group

One of the ways to ensure stress-free work environment and optimal patient care is mutual support among professional colleagues. An advisory group was set up last year so that they can be contacted if any of us is caught in a complex clinical dilemma / dealing with aggressive clients or is apprehensive about how to document or effectively troubleshoot a potential problem. The same group will continue to provide timely advice and is led by

Convener- Dr. Vijay Zutshi- 9818319110

Co convener- Dr. Aruna Nigam- 9868656051

We invite suggestions from all members regarding functioning of this cell which will guide us forming the SOPs. Pl mail to **aogd.ucmsgtbh2023@gmail.com**

AOGD Sub - Committee Chairpersons 2023-25			
Committee	Chairperson	Contact No	Email id
Adolescent Health Sub-Committee	Dr Jyoti Bhaskar	9711191648	jytbhaskar@yahoo.com
Endometriosis Sub-Committee	Dr Reena Yadav	9868996931	drreenalhmc@gmail.com
Endoscopy Sub-Committee	Dr Swati Agrawal	9810181964/ 9953938995	drswatilhmc@gmail.com
Fetal Medicine & Genetics Sub-Committee	Dr Sangeeta Gupta	8368199481/ 9968604349	drsangeetamamc@gmail.com
Oncology Sub-Committee	Dr Saritha Shamsunder	9313826748	shamsundersaritha@gmail.com
QI Obst & Gynae Practice Sub-Committee	Dr Kiran Aggarwal	9312277346	dr_kiranaggarwal@hotmail.com
Urogynaecology Sub-Committee	Dr Monika Gupta	9312796171	drmonikagupta@hotmail.com
AOGD Sub - Committee Chairpersons 2022-24			
Committee	Chairperson	Contact No	Email id
Breastand Cervical Cancer Awareness, Screening & Prevention sub-committee	Dr Mrinalini Mani	9911835888	drmrinal5@gmail.com
Infertility & Reproductive Endocrinology sub-committee	Dr Manju Khemani	9810611598	dr.manjukhemani@gmail.com
Community Health & Public Awareness sub-committee	Dr Shivani Agarwal	9868249464	dragarwal.shivani@gmail.com
Safe Motherhood sub-Committee	Dr Kiran Guleria	9811142329	kiranguleria@yahoo.co.in

Associaton of Obstetricians & Gynaecologists of Delhi

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Place of Working: .....

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Mobile No:..... **Email:** .....

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Date of Birth: Date.....**Month** ..... **Year.**.....

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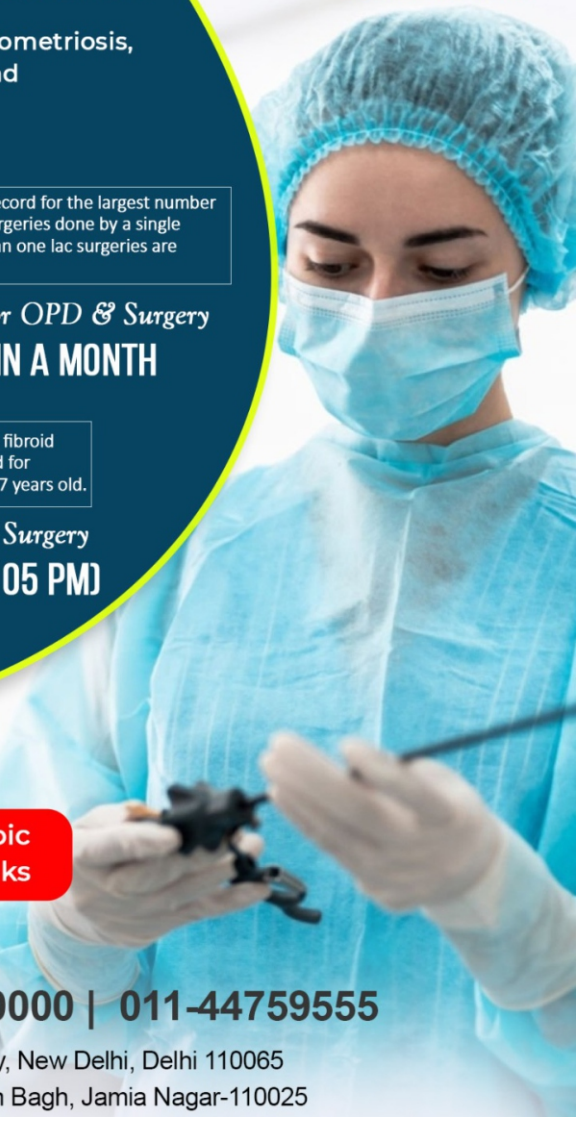

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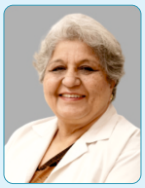

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