NARCHI BULLETIN

MAMC, Issue 4, December 2021

Preventive Care in Obstetrics.....A Stitch in Time

NARCHI Secretariat
Department of Obstetrics and Gynecology
Maulana Azad Medical College, Lok Nayak Hospital
Jawahar Lal Nehru Marg, Delhi-110002, Ph- 011-23235823
Email: narchidelhimamc@gmail.com | Website: www.narchidelhi.com

Office-Bearers 2020-2022

Dr Asmita M Rathore
President

Dr Anjali Tempe
Advisor

Dr Gauri Gandhi
Vice-President

Dr Sangeeta Gupta
Secretary

Dr Niharika Dhiman

Dr Chetna A Sethi

Joint Secretaries

Dr Y M Mala

Dr Deepti Goswami

Executive Members

Dr Madhavi M Gupta
Treasurer

Dr Bidhisha Singha
Co-Treasurer

Editorial Board

Dr Poonam Kashyap

Dr Reena Rani

Co-Editors

Dr Sangeeta Bhasin

Dr Shakun Tyagi

Editors

Dr Pushpa Mishra

Dr Shalini Shakarwal

Web Editors

Committees

Dr Latika Sahu

Dr Krishna Agarwal

Dr Devender Kumar

Dr Ajay Kumar

Dr Seema Kapoor

Scientific Committee

Dr Rachna Sharma

Dr Renu Tanwar

Dr Shikha Sharma

Dr Poonam Sachdeva

Dr Preeti Singh

Dr Nalini B Pandey

Dr Nidhi Garg

Dr Ashish Jain

Outreach Committee

NARCHI Secretariat
Department of Obstetrics and Gynecology
Maulana Azad Medical College, Lok Nayak Hospital
Jawahar Lal Nehru Marg, Delhi-110002, Ph- 011-23235823
Email: narchidelhimamc@gmail.com | Website: www.narchidelhi.com

NARCHI Bulletin

MAMC, Issue 4, December 2021

Contents

Publisher/Printer/Editor
Dr Sangeeta Bhasin & Dr Shakun Tyagi on behalf of National Association for Reproductive & Child Health of India, Delhi Branch.

Printed at
Process & Spot C-112/3, Naraina Industrial Area, Phase-1, New Delhi 110 028

Published from
Department of Obstetrics and Gynecology, Maulana Azad Medical College
Lok Nayak Hospital, Jawahar Lal Nehru Marg, Delhi-110002

From The President's Pen

Dear friends,

Warm Greetings to all !

First and foremost, I thank all the esteemed NARCHI members for making the 27th annual NARCHI e-conference held in august 2021 a grand success. It was the hard work of the core NARCHI team coupled with all your support and co operation which made this possible. My heartiest congratulations to you all.

I also congratulate Dr Manju Puri and Dr Reena Yadav for being elected as president and vice president for NARCHI 2022-2024. I am sure their tenure will see the association rise to new heights and we offer them our full support.

As the Covid crisis continues and the threat of the third wave looms large upon us, we release this issue of the NARCHI bulletin on 'Preventive care in Obstetrics'. When we talk about 'prevention' in obstetrics the first thing to strike us all is 'preventing maternal mortality', an important indicator of the health care delivery system of any nation. Reduction in the preventable causes of maternal mortality will help us in achieving the SDG target of maternal mortality ratio (MMR) of less than 70 maternal deaths per 100,000 live births by the year 2030 from the current status of 113 maternal deaths per 100,000 live births.. This issue provides an insight into the preventive aspects of some important causes of maternal and perinatal morbidity and mortality like anemia, hypertension, prematurity, fetal growth restriction, genetic disorders and congenital anomalies. 'Immunization' during pregnancy and Newborn screening methods have also been dealt with.

I am sure you will find the bulletin useful.

Wishing you all a 'Merry Chirstmas' & a very 'Happy and safe New Year'!

Dr Asmita Muthal Rathore
President NARCHI Delhi

From The Secretary's Desk

Dear Members,

Warm Greetings!

We extend our sincere thanks to all our members for making 27th NARCHI Annual Conference- NARCHIDELCON-2021, a grand success. The conference committee did a spectacular job of organizing five preconference workshops and 22 scientific sessions. The other highlights were over 120 paper presentations, Sheela Mehra quiz and oration by Sir S Arulkumaran. The conference was well received with overwhelming response for the handpicked scientific sessions delivered by eminent faculty.

In co-ordination with Health and Family Welfare Training Centre, New Delhi; our team has been instrumental in conducting training sessions for trainers to promote family planning services at the primary healthcare level also. A successful TOT program was conducted over two days where nearing seventy trainers were trained.

Furthering our endeavor to fulfil our motto of promoting women and child health, we congratulate our editorial team for having this bulletin on 'Preventive care in Obstetrics' a topic which covers many vital aspects important for clinicians and academicians alike.

Preventive Obstetrics is imperative for promoting maternal and neonatal health through prevention and early detection of complications during pregnancy. This involves screening and periodic examinations and detecting congenital anomalies in-utero along with newborn screening. We hope this bulletin will be instrumental in laying a road map for preventive care in Obstetrics and Gynaecology.

Happy reading!

Secretary

Dr Sangeeta Gupta **Dr Niharika Dhiman** **Dr Chetna Arvind Sethi**

From The Editorial Board

Hello Friends,

Greetings of the winter season!!

To begin with, we would like to sincerely thank all NARCHI members for making the 27th annual NARCHI conference a huge success. Your constant support and encouragement and the complete dedication of the organizing team did it all and a thunderous applause are in order.

As we inch towards the twilight of our tenure, we bring to you the fourth issue of the NARCHI e-bulletin on 'Preventive care in Obstetrics'. The bulletin begins with some comprehensive information on "Preconceptional and antenatal preventive care in medical and obstetric disorders "put forth by Dr. Devender Kumar. Evidence-based, crucial preventive and screening strategies in obstetric conditions like prematurity and fetal growth restriction and medical conditions like anaemia, gestational diabetes mellitus and hypertension have been very well described by him. The important topic of Prevention and early detection of genetic disorders", aneuploidies and congenital anomalies, a topic of great concern in this medicolegal age has been justly written by Dr Chittala Kiran. 'Immunisation in Obstetrics and Gynecology' has been beautifully described by Dr YM Mala. Newborn screening for various disorders has been covered by Dr Seema Kapoor and her team, renowned faculty from the department of Paediatrics, MAMC. As knowledge is insufficient without recent updates, the same have been included with each topic. WHO recommendations on Labour Care Guide have been given a special corner. As always, a quiz for youngsters and snippets related to women path breakers have also been included.

We hope you will find these articles as interesting and valuable as we have found them.

Wishing you all a 'Merry Christmas' and a 'Happy New Year' filled with life and laughter.

Happy reading….

Narchi Editorial Team

Dr Sangeeta Bhasin **Dr Shakun Tyagi** **Dr Poonam Kashyap** **Dr Reena Rani**

Abbott

For the use of a Registered Medical Practitioner or a Hospital or a Laboratory only

Women FIRST

The trusted progestogen completes **60 years**#

IF IT'S **ORALLY** EFFECTIVE, IT'S†

Duphaston®

Dydrogesterone Tablets IP 10 mg

BACKED BY **EVIDENCE**

We have supplemented our range with

Estrabet™

Estradiol (as Hemihydrate) Tablets USP 1mg/2mg

A Novel^ Safer+ Estrogen

Estrabet gel

Estradiol Transdermal Gel 0.06% w/w

A Novel^ Safer+ Estrogen

Solfe*

Sodium Feredetate, Folic Acid & Vitamin B_{12} Tablets

MADE FOR HER. CARES FOR HER

Mirza F, et al, Dydrogesterone use in early pregnancy, Gynecol Endocrinol. 2016;32(2):97-106. † Schindler AE. Progestational effects of dydrogesterone in vitro, in vivo and on human endometrium, Maturitas. 2009;65(1):S3–S11.
^ Novel-Estradiol hemihydrate first time in India. +Safer-As compared to conjugated equine estrogens, Smith NL et al Lower risk of cardiovascular events in postmenopausal women taking oral estradiol compared with oral conjugated equine estrogens. JAMA Intern MED. 2014; 174(1):25-31. * As Prescribing Information of Solfe, version 1; Dated: 25th July 2013

For full prescribing information, please contact: Abbott India Limited, Floor 16, Godrej BKC, Plot C-68, 'G' Block, Bandra-Kurla Complex, Near MCA Club, Bandra East, Mumbai-400 051. www.abbott.co.in

And strengthened our portfolio with

Novelon®

Desogestrel & Ethinylestradiol Tablets USP

Each uncoated tablet contains: Desogestrel BP: 0.15mg, Ethinylestradiol IP: 0.03mg

Femilon®

Desogestrel & Ethinylestradiol Tablets USP

Each uncoated tablet contains: Desogestrel BP: 0.15mg, Ethinylestradiol IP: 0.02mg

MSD INVENTING FOR LIFE

Organon (India) Pvt Ltd.,
Platina Building, 8th Floor, C-59, G-Block, Bandra Kurla Complex, Bandra (East), Mumbai 400051. Tel.no: 022-67898888
IN-XHB-00017 19/1/2021 to 14/1/2022
Please refer to full prescribing information before prescribing Novelon & Femilon
For reporting an Adverse Event visit contact us at www.msdindia.in

Abbott

Marketed and distributed by: **Abbott India Limited,**
Floor 16, Godrej BKC, Plot C-68, 'G' Block, Bandra-Kurla Complex, Near MCA Club, Bandra East, Mumbai - 400051
For Product Complaints/Adverse events or Queries please write to webmasterindia@abbott.com

IND2177598 16 Feb 2021

Preconception and Antenatal Preventive Care: Medical and Obstetric Disorders

Devender Kumar
Professor, Department of Obstetrics and Gynaecology, MAMC and Associated LNH

Preconception and antenatal care are essential biomedical, behavioral and community help to couples planning conception and continuing with pregnancy. Preconceptional anxiety and antenatal tensions are high if there is history of congenital malformations, pregnancy loss or hereditary disorders in the family. Most of these may be avoided or markedly reduced if appropriate preconceptional counseling and effective antenatal care are available. Preconception care will have positive impact on maternal and child health outcomes. A few such clinical conditions are discussed here with latest updates.

Hypertensive Disorders

Hypertensive disorders are most challenging during pregnancy especially pre-eclampsia. Gestational hypertension and preeclampsia (PE) are seen in 5 – 10 % of gestations. It forms a deadly triad of maternal morbidity with hemorrhage and sepsis. Hypertensive disorders during pregnancy particularly pre-eclampsia have acute and long-term consequences for the mother and the fetus.[1,2] That include risk of chronic hypertension, cardiovascular disease, stroke, and metabolic syndrome for the mother and complications of prematurity for the neonate, along with increased risk of hypertension, diabetes, and neurological impairment later in their lives.[3-7] Psychological consequences from experiencing preeclampsia, especially in severe cases, also have been reported for the woman and her family.[8]

Obstetricians have a challenge to early diagnose the disorder and predict the severity for prognosis. Along with that, obstetricians also have to plan the management for optimal growth of the fetus and least morbidity to mother. Risk of recurrence of gestational hypertension or pre-eclampsia are 16% if delivered at term, 25% if delivered before 34weeks, 55% delivered before 28 weeks.[9]

Prediction of Pre-eclampsia

Pre-eclampsia syndrome is predominantly considered as the consequence of impaired placentation. Placenta is mature and functional by 18 – 20 weeks so this condition is diagnosed after 20 weeks of pregnancy. There are two types, early onset PE, requiring delivery before 34 weeks' gestation and late onset PE, with delivery at or after 34 weeks, because the former is associated with a higher incidence of adverse outcome.[10-13]

Age of the Mother and Urinary Tract Infections

Mothers who are <20 years of age and ≥30 years old are 5 to 7 times more likely to develop preeclampsia compared to the 20-29 age group.[14-19] Presence of a history of UTI increases the risk of pregnant women of developing preeclampsia by 3 times. It has also been hypothesized that renal damage related to preeclampsia may also underlie the patient's predilection to kidney infections.[18-19]

Mean Arterial Pressure[20]

In low-risk populations a mean arterial pressure in the second trimester best predicted pre-eclampsia. Mean arterial pressure is a better predictor for pre-eclampsia than systolic and diastolic blood pressure. In a normotensive case, blood pressure measurements at the first antenatal visit in the first and second trimester does not help predict pre-eclampsia.

Roll-over test had been recommended as a routine test for every pregnant patient between 28 – 32 weeks' gestation for the early diagnosis of hypertension of pregnancy[21,22] but was later found to have low sensitivity.[23]

Calcium Excretion and Creatinine Clearance

Calcium excretion has been found to be reduced in preeclampsia.[24,25,26] Rodriguez et al, found a sensitivity of 70% and specificity of 95% for the development of PE using a Ca/Cr ratio of 0.04 (conventional units) in a fasting spot urine from 88 normal pregnant women. Using a urinary calcium concentration threshold of 12 mg/dL, Sanchez-Ramos et al found a sensitivity of 85% and specificity of 91% for predicting preeclampsia.

Uterine Artery Doppler

Uterine artery Doppler ultrasonography predicts pre-

eclampsia, the maternal consequence of placental disease, more confidently than intrauterine growth restriction. Specifically, an increased pulsatility index with notching in the second trimester best predicted overall pre-eclampsia in low-risk and high-risk patients. An increased pulsatility index or bilateral notching best predicted severe pre-eclampsia.

The predictive accuracy of first-trimester uterine artery Doppler is better in the detection of early-onset preeclampsia than late-onset disease. The sensitivities and specificities of uterine artery Doppler is not effective and low, that limits its utility as a disease marker in isolation.[27]

Maternal Serum PAPP-A, PlGF and Glycosylated Fibronectin (Biochemical Markers)

In pregnancies that develop PE, MoM values of UtA-PI and MAP at 11–13 weeks' gestation were increased and the values of serum PAPP-A and PlGF were decreased. The best individual biomarker for preterm PE was PlGF, followed by UtA-PI and MAP and then PAPP-A. The performance was better in combination of maternal factors, MAP, UtA-PI and serum PlGF. Screening for preterm PE at 11–13 weeks' gestation identifies a group of pregnancies that would benefit from prophylactic use of aspirin. Screening for preterm PE should be universal rather than selective. Placental growth factor (PlGF) is the most discriminating biomarker for PE. PlGF levels are significantly lower in pregnant women who develop PE, and PlGF combined with other factors has 93% detection rate for the risk of developing PE in the first trimester with a false-positive ratio of 5%. The other factors included maternal history, prior and family history of PE, maternal blood pressure, uterine artery pulsatility index, and pregnancy-associated plasma protein A (PAPP-A).[28] Maternal serum glycosylated fibronectin levels in the first trimester have also been found to be significantly higher in women with preeclampsia ($P < .01$) and remain higher throughout pregnancy ($P < .01$).[29]

Prevention of Preeclampsia

Calcium Therapy

High-dose calcium supplementation (≥ 1 g/day) may reduce the risk of pre-eclampsia and preterm birth, particularly for women with low calcium diets (low-quality evidence). The treatment effect may be overestimated due to small-study effects or publication bias. It reduces the occurrence of the composite outcome 'maternal death or serious morbidity', but not stillbirth or neonatal high care admission.[26]

Low-dose Aspirin therapy[30,31]

Administering low-dose aspirin to pregnant women leads to small-to-moderate benefits, including reductions inpre-eclampsia (16 fewer per 1000 women treated), preterm birth (16 fewer per 1000 treated), the baby being born small-for-gestational age (seven fewer per 1000treated) and fetal or neonatal death

Table 1: Scoring system for Hypertensive Disorders of Pregnancy Gestosis Score

Risk factor	Score	Risk Factor	Score	Risk Factor	Score
Age older than 35 years	1	Inter pregnancy interval more than 7 years	1	Multifetal pregnancy	2
Age younger than 19 years	1	Conceived with Assisted Reproductive (IVF/ ICSI) Treatment	1	Hypertensive disease during previous pregnancy	2
Maternal Anemia	1	MAP>85 mm of Hg	1	Pregestational diabetes mellitus	3
Obesity (BMI >30)	1	Chronic vascular disease (Dyslipidemia)	1	Chronic hypertension	3
Primigravida	1	Excessive weight gain during pregnancy	1	Mental disorders$	3
Short duration of sperm exposure (cohabitation)	1	Maternal hypothyroidism	2	Inherited / Acquired Thrombophilia	3
Woman born as small for gestational age	1	Family history of preeclampsia	2	Maternal chronic kidney disease	3
Family history of cardiovascular disease	1	Gestational diabetes mellitus	2	Autoimmune disease (SLE / APLAS / RA)	3
Polycystic ovary syndrome	1	Obesity (BMI > 35 kg/M2)	2	Pregnancy with Assisted Reproductive (OD or Surrogacy) Treatment	3

Ensuring management using following factors will ensure optimum management of women at high risk for Preeclampsia

1. Corelate gestational age of previous pregnancy associated with preeclampsia and its severity
2. Assess for any other comorbidities including lifestyle disorders
3. Complete evaluation of medical conditions
4. Multi-professional team management will provide better outcomes
5. Update patient and relatives about realistic management and their options
6. Avoid pregnancy till comorbidities are under control
7. Case-based management protocols along with clear hospital policies are essential. These cases should be advised about calcium supplementation and role of low dose aspirin
8. Blood pressure should be monitored along with urine test for albuminuria on every antenatal visit
9. Patient should be counseled to monitor their BP at home regularly and report if 140/90 mm Hg or more
10. Patient should be educated about warning signs like headache, blurring or loss of vision, epigastric pain

(five fewer per 1000 treated). Overall, administering antiplatelet agents to 1000 women has been found to translate to 20 fewer pregnancies with serious adverse outcomes. The quality of evidence for all these outcomes was high.

The ASPRE trial[31] has shown that, in pregnancies identified at 11–13 weeks' gestation by screening with maternal factors and biomarkers as being at high-risk for pre-eclampsia (PE), administration of aspirin (150 mg/day from 11–14 to 36 weeks' gestation) reduces the rate of early PE with delivery at < 32 weeks' gestation by about 90% and that of preterm PE with delivery at <37 weeks by 60%. In the ASPRE study, eligible women with an estimated risk for preterm PE of > 1 in 100 were invited to participate in a double-blind trial of Aspirin (150 mg per day) vs placebo from 11–14 weeks until 36 weeks' gestation. In the aspirin group, the incidence of preterm PE was reduced by 62%.

High risk factors for preeclampsia are essential hypertension, history of preeclampsia in previous pregnancy, obesity, renal disorders, diabetes, thyroid disorders, hyperaldosteronism, multiple pregnancy, underlying APLA syndrome or family history. Table 1 gives the risk scoring for preeclampsia. This HDP-Gestosis score has been proposed jointly by FOGSI and ICOG[32]

All women with score equal/ more than 3 should be started with Aspirin 75-150 mg 12 weeks onwards.

Anemia[33 -36]

India is facing a serious burden of anemia where more than half of the women (51%) of reproductive age suffer from anemia (Global Nutrition Report 2017). According to the National Family Health Survey 4 (NFHS-4), 53.1% of non-pregnant women aged 15-49 years, 50.3% of pregnant women aged 15-49 years, and 53% of all women aged were anemic in India.[37] National Nutritional Anemia Prophylaxis Program was launched by Maternal and Child Health (MCH) division of Ministry of Health and Family Welfare (MOHFW) in 1970 to prevent nutritional anemia in mothers and many other initiatives were taken but it was observed during the period 2005 to 2015, the reduction of anemia was less than 1% per annum. This slow and ineffective change is matter of concern and taken seriously. Along with PMSMA, The Anemia Mukta Bharat (AMB) was launched in 2018 to reduce prevalence of anemia all over India. It is initiative of the Ministry of Health and Family Welfare (MoHFW) & United Nations Children's Fund (UNICEF). The scheme is part of the Intensified National Iron Plus Initiative (NIPI) Program and comes under the Prime Ministers overarching scheme for holistic nutritional Nourishment (POSHAN) Abhiyan. It focusses on six target beneficiary groups, through six interventions and six institutional mechanisms to achieve the envisaged target under the POSHAN Abhiyan(6x6x6):

1. Prophylactic Iron and Folic Acid supplementation
2. Deworming
3. Intensified year-round Behaviour Change Communication Campaign (Solid Body, Smart Mind) including ensuring delayed cord clamping in newborns
4. Testing of anemia using digital methods and point of care treatment
5. Mandatory provision of Iron and Folic Acid fortified foods in government-funded health programmes
6. Addressing non-nutritional causes of anemia in endemic pockets, with special focus on malaria, haemoglobinopathies and fluorosis

Complying with the targets of POSHAN Abhiyaan and National Nutrition Strategy set by NITI Aayog, the Anemia Mukt Bharat strategy has been designed to

reduce prevalence of anemia by 3 percentage points per year among children, adolescents and women in the reproductive age group (15–49 years), between the year 2018 and 2022. It aims to reduce iron deficiency anemia in pregnancy from 50%(NFHS 4) to 32% as National target 2022.

As per the guidelines of this Andolon, daily one iron and folic acid tablet must be started from the fourth month of pregnancy (that is from the second trimester) and continued throughout pregnancy (minimum 180 days during pregnancy). Each tablet contains 60 mg of elemental iron + 500 mcg of folic acid and it is sugar-coated, red-color now. All pregnant women must have Hb and hematocrit estimation in first trimester and at term.

Fetal Growth Restriction

Fetal growth restriction (FGR) is defined as failure of the fetus to reach its potential to grow in the womb. Approximately 10% of pregnancies suffer from impaired fetal growth. Fetal growth is evaluated by using standard references of population based estimated fetal weight or birth weight for different gestational ages. FGR is diagnosed when estimated fetal weight or birth weight is less than 10th percentile to population standards. FGR is associated with increased fetal and neonatal mortality and morbidity. It is linked to perinatal adverse events (prematurity, cerebral palsy, intrauterine fetal death, neonatal death). It is also associated with adult pathologic conditions (obesity, hypertension, type-2 diabetes).

FGR is associated with low levels of pregnancy associated plasma protein A (PAPPA), an Insulin–like Growth Factor Binding Protein Protease.[37] Increased resistance in the uterine arteries is another important investigation as it is associated with poor obstetric outcome like preeclampsia, IUGR or prematurity, the positive predictive value was found to be only 15% for IUGR. Gomez et al. in 2006 examined the changes in the uterine flow between the first and second trimester. It correlated with occurrence of FGR and persistent low vascular indices had highest risk. Doppler assessment is not advised for low-risk population to screen FGR.[38]

For risk stratification, high-risk mothers are evaluated with maternal and familial history, maternal anthropometry (maternal pre-pregnancy weight and height), maternal nutritional status, exact gestational dating, serial fundal height estimation, non-stress test (NST), ultrasound with Doppler, and accurate fetal weight measurements. An abnormal HC/AC ratio is more specific and have negative predictive value for asymmetric FGR. Biophysical profile (BPP) reflects the fetal acid–base status and has been used to assess the risk for FGR. NST is abnormal in FGR and reactivity disappears followed by fetal breathing. Amniotic fluid reduction is the last event. Doppler studies are helpful to assess placental insufficiency. For FGR, uterine artery Doppler, umbilical artery Doppler, middle cerebral artery Doppler, Cerebro-placental ratio (CPR), ductus venosus Doppler, and aortic isthmus Doppler are used to define the prognosis.

Uterine arteries are predictors of maternal circulation, whereas the umbilical and middle cerebral arteries provide information about the fetal circulation. Uterine artery Doppler are not sensitive and specific to predict adverse outcome in SGA fetuses. Umbilical artery (UA) Doppler provides both diagnostic and prognostic knowledge in the management of FGR. The various Doppler abnormalities seen in IUGR are increased resistance in blood vessels or absent and reverse end diastolic flow (AREDF). Increased umbilical artery Doppler perfusion index (PI) has shown good correlation of early identification of FGR, both alone or with the Cerebro-placental ratio (CPR) ratio. AREDF is usually associated with injury to various fetal organs or death.

Prediction Prevention and Treatment of Preterm Labor

Preterm is referred to gestation age less than 37 weeks and in no circumstances, it should be considered as normal labor. Preterm labor is 5-18% prevalent among live births worldwide.[39,40] It is ironical that Obstetrician has to predict and prevent premature births, vis a vis will deliver a preterm baby due to medical conditions like eclampsia, Rh isoimmunization or FGR. Most of the preterm labor are spontaneous (80%).[41] As an expert he/she has to ensure the fetal survival and prevent perinatal morbidity mortality. Preterm labor is associated with complications which not only affects the baby but parents and attending physicians (obstetrician or neontologist) too. It is psychological and financial burden on family and community. "Going home" chances of preterm baby depends on gestational age, birth weight, lung maturity and neural protection at birth. Surfactant and modern neonatal ICU (NICU) have improved the survival of 24-week baby but their neural development is still questionable.[42,43]

The common causes of preterm births are multiple gestation, preterm, hypertensive disorders like severe

pre-eclampsia or eclampsia, pre-labor rupture of membranes, antepartum hemorrhage, hydramnios, congenital malformations etc. Preterm births can be divided in three categories as extremely preterm (less than 28 weeks), very preterm (28 to 32 weeks) and moderate to late preterm (32 to 37 weeks).

Maternal causes like previous obstetric history of preterm birth, multiple gestation, periodontal disease, obesity, heart disease, antepartum hemorrhage or hypertensive disorders are risk factors for preterm birth. The most common predictor of preterm birth is past history of preterm labor. Preterm birth is also seen among smokers, drug abusers, history of cervical amputation or LEEP procedure. It can occur in cases with fibroid uterus or genitourinary infections.[44-45] Other than past history of preterm birth, other predictors are cervical length, uterocervical angle (anteversion), Placental alpha-microglobulin-1 (PAMG-1), fetal fibronectin, and insulin-like growth factor binding protein-1 (IGFBP-1) are also associated with preterm labor. Maternal serum calponin 1 and ratio of maternal serum alpha fetoprotein (AFP) to amniotic fluid AFP are also potential predictor of preterm birth. The Preterm SAMBA study results will throw more light on preterm birth prediction. It is based on metabolomics techniques, and well-defined protocols for sample collection among multi-ethnic populations.[46] Cervix length of 2.5 cm or less has 55% sensitivity and 10% false positive rate. Concentration of more than 50 ng/ml of fetal fibronectin is positive considered as positive predictor of preterm labor.

Good antenatal care is the single most effective way to prevent or decrease the complications of preterm labor. All cases with history of preterm labor before 34 weeks should be offered vaginal progesterone supplementation from 16 weeks onward (likelihood decrease of preterm labor by 45%).[47] Prophylactic as well as rescue cerclage is useful if cervical length is 25 mm or less between 16 – 24 weeks of pregnancy. Consider tocolysis (preferably nifedipine and avoid betamimetics) for all cases of threatened preterm labor from 24 weeks or more till 34 weeks of pregnancy. This does not prevent preterm births but definitely help in providing the corticosteroids for fetal lung maturity. Best tocolysis is oxytocin receptor antagonists. Tocolytics (prostaglandin inhibitors and calcium channel blockers) are must for antenatal corticosteroids and magnesium sulfate administration.[47] In some cases, it will give time to transfer the mother to a tertiary facility where neonatal intensive care unit is available. Intravenous magnesium sulfate has neuroprotective effects on preterm births and should always be used between 24+0 and 33+6 weeks of pregnancy. It decreases the risk of cerebral palsy in infants born at less than 32 weeks' gestation. It should be given in established preterm labor cases too during this period of gestation.

Conclusion

Medical and obstetric disorders are related to high maternal and perinatal morbidity and mortality. Preeclampsia, anemia, fetal growth restriction and prematurity are important disorders amongst these. Many complications may be avoided or markedly reduced if appropriate preconceptional counseling with identification of high risk factors and antenatal care with right preventive measures are available.Every couple must have a choice to plan their pregnancy and get good preconception counseling. It is not only the health education and promotion for society but for community and nation too. It can play a major role in reduction of maternal as well as perinatal morbidity.

References

1. Eiland E, Nzerue C, Faulkner M. Preeclampsia. J Pregnancy. 2012: 586578.
2. Xiong X, Demianczuk NN, Saunders LD, Wang FL, Fraser WD. Impact of preeclampsia and gestational hypertension on birth weight by gestational age. Am J Epidemiol2002; 155:203–9.
3. Magee LA, Pels A, Helewa M, Rey E, von Dadelszen P. The hypertensive disorders of pregnancy. Best Pract Res Clin Obstet Gynaecol 2015; 29:643–57.
4. Pauli JM, Repke JT. Preeclampsia: short-term and long-term implications. Obstet Gynecol Clin North Am 2015; 42:299–313.
5. Brown MC, Best KE, Pearce MS, Waugh J, Robson SC, Bell R. Cardiovascular disease risk in women with pre-eclampsia: systematic review and meta-analysis. Eur J Epidemiol 2013; 28:1–19.
6. Ahmed R, Dunford J, Mehran R, Robson S, Kunadian V. Pre-eclampsia and future cardiovascular risk among women: a review. J Am Coll Cardiol 2014; 63:1815–22.
7. Carson MP. Society for maternal and fetal medicine workshop on pregnancy as a window to future health: clinical utility of classifying women with metabolic syndrome. Semin Perinatol 2015; 39:284–9.
8. Grace T, Bulsara M, Pennell C, Hands B. Maternal hypertensive diseases negatively affect offspring motor development. Pregnancy Hypertens 2014; 4:209–14.BMJ 2013; 346: f894.
9. C. K. H. Yu, O. Khouri, N. Onwudiwe, Y. Spiliopoulos, and

K. H. Nicolaides, "Prediction of pre-eclampsia by uterine artery Doppler imaging: relationship to gestational age at delivery and small-for-gestational age," Ultrasound in Obstetrics & Gynecology, vol. 31, no. 3, pp. 310–313, 2008.

10. A. G. Witlin, G. R. Saade, F. Mattar, and B. M. Sibai, "Predictors of neonatal outcome in women with severe preeclampsia or eclampsia between 24 and 33 weeks' gestation," The American Journal of Obstetrics and Gynecology, vol. 182, no. 3, pp. 607–611, 2000.
11. H. U. Irgens, L. Reisæter, L. M. Irgens, and R. T. Lie, "Long term mortality of mothers and fathers after pre-eclampsia: population-based cohort study," British Medical Journal, vol. 323, no. 7323, pp. 1213–1216, 2001.
12. P. von Dadelszen, L. A. Magee, and J. M. Roberts, "Subclassification of Preeclampsia," Hypertension in Pregnancy, vol. 22, no. 2, pp. 143–148, 2003.
13. Department of Health, Maternal Deaths by Main Cause [Internet]. 2013. Available from: http://www.doh.gov.ph/node/1484.
14. Ghojazadeh M, Azami-Aghdash S, Mohammadi M, Vosoogh S, Mohammadi S, Naghavi-Behzad M. Prognostic risk factors for early diagnosing of Preeclampsia in Nulliparas. Niger Med J. 2013 Sep; 54(5):344-8.
15. Lamminpaa R, Vehvilainen-Julkunen K, Gissler M., Heinonen S. Pre-eclampsia complicated by advanced maternal age: a registry-based study on primaparous women in Finland 1997-2008. BMC Pregnancy Childbirth. 2012; 12:47.
16. Liu X, Ruan Y, Liu Y, Zhang W. Relationship between maternal age and hypertensive disorders in pregnancy. Zhonghua Yi Xue Za Zhi. 2015 Jan; 95(1):19-22.
17. Wallis AB, Saftlas AF, Hsia J, Atrash HK. Secular trends in the rates of preeclampsia, eclampsia, and gestational hypertension, United States, 1987-2004. Am J Hypertens. 2008 May; 21(5):521-6.
18. Johnson EK, Urinary Tract Infections in Pregnancy [Internet]. Available from http://emedicine.medscape.com/ article/452604-overview
19. Jeltsje S Cnossen, Karlijn C Vollebregt, Nynke de Vrieze, Gerben ter Riet, Ben W J Mol, Arie Franx, Khalid S Khan, Joris A M van der Post. Accuracy of mean arterial pressure and blood pressure measurements in predicting pre-eclampsia: systematic review and meta-analysis. BMJ; 2008.
20. Cunningham FG, Leveno KJ, Bloom SL, et al. Williams Obstetrics, 24th ed. New York: McGraw-Hill Education; 2014.
21. Marshall GW, Newman, RL. Roll-over test. Am J Obstet Gynecol. 1977; 127(6), 623-5.
22. Marcopito LF. Roll-over test in primigravidae attending a public primary care service. Sao Paulo Med J. 1997 Sep-Oct;115(5):1533-6.
23. Duley L, Meher S, Hunter KE, Seidler AL, Askie LM. Antiplatelet agents for preventing pre-eclampsia and its complications. Cochrane Database of Systematic Reviews 2019, Issue 10. Art. No.: CD004659. Available at: https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD004659.pub3/epdf/abstract
24. Rodriguez MH, Masaki DI, Mestman J, et al: Calcium/creatinine ratio and microalbuminuria in the prediction of preeclampsia. Am J Obstet Gynecol 1988;159:1452–1455
25. Sanchez-Ramos L, Sandroni S, Andres FJ, Kaunitz AM: Calcium excretion in preeclampsia. Obstet Gynecol 1991;77:510–513Rolnik DL, Wright D, Poon LC, O'Gorman N, Syngelaki A, de Paco Matallana C, Akolekar R, Cicero S, Janga D, Singh M, Molina FS, Persico N, Jani JC, Plasencia W, Papaioannou G, Tenenbaum-Gavish K, Meiri H, Gizurarson S, Maclagan K, Nicolaides KH. Aspirin versus placebo in pregnancies at high risk for preterm preeclampsia. NEnglJMed2017; 377: 613–622.
26. Hofmeyr GJ, Lawrie TA, Atallah ÁN, Torloni MR. Calcium supplementation during pregnancy for preventing hypertensive disorders and related problems. Cochrane Database of Systematic Reviews 2018, Issue 10. Art. No.: CD001059
27. Su Lynn Khong, Stefan C. Kane, Shaun P. Brennecke and Fabrício da Silva Costa. First-Trimester Uterine Artery Doppler Analysis in the Prediction of Later Pregnancy Complications. Disease Markers, vol. 2015, Article ID 679730, 10 pages, 2015. https://doi.org/10.1155/2015/679730
28. Novel Biomarkers of Preeclampsia | AACC.org
29. Juha Rasanen, Matthew J Quinn, Amber Laurie, Eric Bean, Charles T Roberts Jr, Srinivasa R Nagalla, Michael G Gravett. Maternal serum glycosylated fibronectin as a point-of-care biomarker for assessment of preeclampsia. Am J Obstet Gynecol. 2015 Jan;212(1):82.e1-9
30. Rolnik DL, Wright D, Poon LC, O'Gorman N, Syngelaki A, de Paco Matallana C, Akolekar R, Cicero S, Janga D, Singh M, Molina FS, Persico N, Jani JC, Plasencia W, Papaioannou G, Tenenbaum-Gavish K, Meiri H, Gizurarson S, Maclagan K, Nicolaides KH. Aspirin versus placebo in pregnancies at high risk for preterm preeclampsia. *N Engl J Med* 2017; **377**: 613– 622
31. Rolnik DL, Wright D, Poon LC. **ASPRE trial: performance of screening for preterm pre-eclampsia50(4)**492-495
32. FOGSI-GESTOSIS-ICOG Hypertensive Disorders in Pregnancy (HDP) Good Clinical Practice Recommendations 2019 Available from https://www.fogsi.org/wp-content/uploads/gcpr/hdp-fogsi-gestosis-icog-gcpr-2019.pdf
33. Government of India. National Family Health Survey 4-Key Indicators: 2015-2016. Natl Fam Heal Surv 4. 2016;1–8
34. NIHFW. National Nutrition Anemia Prophylaxis Programme. 2009; Available from: http://www.rfhha.org/images/pdf/national_health/NATIO NAL_NUTRITION_ANEMIA_PROPHYLAXIS_PROGRAMME.pdf

35. GoI. Anemia Mukta Bharat. MOHFW RCH Division, November 2019. Available at: English_Anemia-Mukt-Bharat-Training-Modules-Folder_Lowress.pdf
36. Bhatia V, Sahoo DP, Parida SP. India steps ahead to curb anemia: Anemia Mukt Bharat Indian J Comm Health. 2018; 30, 4: 312-316
37. Albu AR, Anca AF, Horhoianu VV, Horhoianu IA. Predictive factors for intrauterine growth restriction. Journal of Medicine and Life Vol. 7, Issue 2, April-June 2014, pp.165-171
38. Sharma et al. Intrauterine Growth Restriction: Antenatal and Postnatal Aspects. Clinical Medicine Insights: Pediatrics 2016:10 67–83 doi: 10.4137/CMPed.S40070
39. H. Torchin and P.Y. Ancel. "Epidemiology and risk factors of preterm birth," Journal de Gyn´ecologie Obst´etrique et Biologie de la Reproduction, 2016; vol. 45, (10), 1213–1230.
40. WHO, "Preterm birth 2016 [updated November 201624/3/2017]," Available at: http://www.who.int/mediacentre/factsheets/fs363/en/
41. Hack M, Fanaroff AA. Outcomes of children of extremely low birthweight and gestational age in the 1990s. Semin Neonatol 2000; 5: 89–106.
42. Hosono S, Ohno T, Kimoto H, Shimizu M, Harada K. Morbidity and mortality of infants born at the threshold of viability: ten years' experience in a single neonatal intensive care unit, 1991–2000. Pediatr Int 2006; 48: 33–39.
43. H. A. Frey and M. A. Klebanof, "Te epidemiology, etiology, and costs of preterm birth," Seminars in Fetal & Neonatal Medicine, vol. 21, no. 2, pp. 68–73, 2016.
44. B. Koullali, M. A. Oudijk, T. A. Nijman, B.W. Mol, and E. Pajkrt, "Risk assessment and management to prevent preterm birth," Seminars in Fetal & Neonatal Medicine, vol. 21, no. 2, pp. 80–88, 2016.
45. J. D. Iams, R. L. Goldenberg, B. M. Mercer et al., "Te Preterm Prediction Study: Recurrence risk of spontaneous preterm birth,"American Journal of Obstetrics & Gynecology, vol. 178, no. 5, pp. 1035–1040, 1998.
46. Cecatti, J.G., Souza, R.T., Sulek, K. et al. Use of metabolomics for the identification and validation of clinical biomarkers for preterm birth: Preterm SAMBA. BMC Pregnancy Childbirth 16, 212 (2016). https://doi.org/10.1186/s12884-016-1006-9.
47. NICE. Preterm labour and birth published on 20 November 2015. Available at: https://www.nice.org.uk/guidance/ng25/resources/preterm-labour-and-birth-pdf-1837333576645

The prevention of disease today is one of the most important factors in line of human endeavor.

- Charles Mayo

Prevention and Early Detection: Genetic Disorders, Aneuploidy, Congenital Anomalies

Chittala Kiran Sri[1]
[1]FNB Fellow (Maternal and Foetal Medicine) Maulana Azad Medical College & Associated Lok Nayak Hospital, New Delhi

The introduction of prenatal care is a major advance in the care of pregnant women and has played a pivotal role in the substantial reduction in maternal and perinatal mortality achieved during the last century.

Few decades ago, antenatal care visits were concentrated during the third trimester, as most common complications occur towards the end of pregnancy. With introduction of early trimester ultrasound and reliable biochemical markers, for the last two decades, we are able to screen and diagnose various genetic disorders, congenital anomalies and foetal aneuploidies in prenatal period. The advances in prenatal care play a major role in the care of pregnant women and result in the substantial reduction in maternal mental stress and perinatal mortality.

Screening for Aneuploidies

Screening for aneuploidies is an important part of routine antenatal care. The most common screening markers in first trimester are maternal age, biochemical analytes and the various sonographic measurements. In second trimester the assessment of multiple serum markers and genetic sonogram are used for aneuploidy screening. Cell-free DNA is the most sensitive and specific, but expensive, screening test for the common foetal aneuploidies but not a diagnostic test. It may be performed as primary screening or as a follow-up test to abnormal findings on first or second-trimester screenings.

A negative screening test substantially decreases the risk of the targeted aneuploidy but does not ensure that the foetus is unaffected. A positive screening test requires genetic counselling, comprehensive ultrasonographic evaluation and diagnostic testing by chorionic villi sampling and/or amniocentesis for foetal genetic analysis.

All patients should be offered an anomaly sonogram between 18 and 22 weeks of gestation for foetal structural defects, since these may occur with or without foetal aneuploidy.

Soft markers are minor ultrasound findings which may be normal variants but are noteworthy because of their association with an increased aneuploidy risk.

When an isolated soft marker is identified after negative screening results, patients may be reassured that the risk of foetal aneuploidy remains low. However, the identification of soft markers remains important to evaluate for associated conditions that are unrelated to foetal aneuploidy.

Genetic Disorders

Hemoglobinopathies are inherited disorders of red blood cells which impose a heavy burden on families and the health sector due to associated morbidity and mortality. The carrier frequency of beta thalassemia in India 3-17%, whereas, that of the sickle cell gene varies from 1 to 35 %.[3]

In India because of cultural barriers and stigma, premarital testing poses a significant challenge. However, it has improved in recent times. Although the ideal time to screen for hemoglobinopathies is premarital period/ preconceptional period, couple testing at 8 weeks of gestation is advised.[4] Extended family screening is recommended for all known and detected carriers and patients.

Table 1: Common screening tests for foetal aneuploidy[1]

Screening method	Gestational age of screening (in weeks)	Detection rate	False positive rate	Analytes
Nuchal Translucency alone	10 to13 6/7	70%	5%	
First trimester screening	10 to 13 6/7	82-87%	5%	NT+PAPPA, free beta hCG
Quad test	15 to 22	81%	5%	hCG, AFP, uE3, DIA
Cell free fetal DNA	10 to Term	99%	2-4% (lowest)	Fetal DNA extracted from the maternal blood

Table 2: Various soft ultrasound markers and their likelihood ratio of aneuploidy[2]

Marker	USG finding	Likelihood ratio (Isolated marker)
Intracardiac echogenic foci	A small (<6mm) echogenic area in either of the cardiac ventricle and visualized in at least 2 separate planes	0.95
Ventriculomegaly	Lateral ventricular dilatation >10mm	3.81
Increased nuchal fold	A thickened nuchal fold is defined as > 6 mm between 15 and 20 weeks of gestation.	3.79
Echogenic bowel	The fetal bowel displays echogenicity equal to or greater than that of the surrounding fetal bone.	1.65
Mild hydronephrosis	Anterior - posterior renal pelvis diameter, with > 4 mm (16 and 27 weeks of gestation) and >7mm after 28weeks	1.08
Short humerus	The ratio of the observed to expected humeral length is <0.90.	0.78
Short femur	The ratio of the observed femoral length to expected femoral length is <0.92.	0.61
Aberrant Right Subclavian Artery	Presence of aberrant right subclavian artery	3.94
Absent or hypoplastic Nasal Bone	Nasal bone length <2.5 mm, or <2.5th centile for gestational age	6.58

The screening test recommended for detection of carrier state of Beta thalassaemia is cation exchange high performance liquid chromatography (CE - HPLC) and it is also helpful for detection of other haemoglobin variants such as HbS, HbC and HbE. Naked Eye Single Tube Red Cell Osmotic Fragility Test (NESTROFT) though simple and less costly, is not sensitive and has a significant error rate. Isolated use of red cell indices [mean cell volume (MCV) < 80 fl and mean cell Hb (MCH) < 27 pg], has been found to miss a significant proportion of beta-thalassaemia carriers during pregnancy.[5]

Detection of causative mutation is the confirmatory test for diagnosis of hemoglobinopathies. Several PCR based methods most commonly Reverse Dot Blot Hybridization, and amplification refractory mutation system (ARMS) are used for detection of a limited number of known mutations and DNA sequencing for unknown mutations.

Foetal Congenital Anomalies

First trimester anomaly scan at 11-13 weeks helps to identify CNS anomalies with good sensitivity. Its detection rate for major anomalies is 49%.[6] In case of open spina bifida, the smaller biparietal diameter, absent intracranial translucency and posterior displacement of cerebellum are the early markers. Cystic abnormalities of the posterior fossa (Dandy-Walker complex) can be occasionally detected. First trimester diagnosis of conditions like acrania, alobar holoprosencephaly and encephalocele is possible, and these anomalies should actively be excluded at every early scan using transvaginal sonography. Screening for spina bifida is feasible in specialist centres with detection rates of 50% to 100% and very low-false positive rates (FPRs). Measuring Alpha fetoprotein levels and ultrasound at 18-20 weeks are the standard practice at some centres to detect neural tube defects. Supplementation of folic acid during periconceptional period is recommended to prevent NTDs.

Congenital heart defects (CHDs) are the most common malformations (8–10/1000 live births). Early ultrasound markers of congenital heart disease are increased nuchal translucency (three fold increase in CHD). An abnormal ductus venosus flow and presence of tricuspid regurgitation are more commonly seen in foetuses with CHDs. In a retrospective study, 57% was the detection rate for major cardiac defects during the first trimester. High detection rates were achieved for hypoplastic left heart syndrome (HLHS) (100%), and for atrioventricular (AV) canal (80%) and right heart (71%) defects.[6]

Conclusion

Screening for carrier status for beta-thalassaemia and other haemoglobinopathies should be offered to all couples. The first trimester aneuploidy screening and anomaly scan can detect majority of abnormal foetuses. Second trimester is still an opportunistic window to screen for anomalies.

References

1. Screening for Fetal Chromosomal Abnormalities, Obstetrics & Gynecology: October 2020 - Volume 136 - Issue 4 - p 859-867, doi: 10.1097/AOG.0000000000004107
2. Society for Maternal-Fetal Medicine (SMFM). Electronic address: pubs@smfm.org, Prabhu M, Kuller JA, Biggio JR. Society for Maternal-Fetal Medicine Consult Series #57: Evaluation and management of isolated soft ultrasound markers for aneuploidy in the second trimester: (Replaces Consults #10, Single umbilical artery, October 2010; #16, Isolated echogenic bowel diagnosed on second-trimester ultrasound, August 2011; #17, Evaluation and management of isolated renal pelviectasis on second-trimester ultrasound, December 2011; #25, Isolated fetal choroid plexus cysts, April 2013; #27, Isolated echogenic intracardiac focus, August 2013). Am J Obstet Gynecol. 2021 Oct;225(4):B2-B15. doi: 10.1016/j.ajog.2021.06.079. Epub 2021 Jun 23. PMID: 34171388.
3. NHM, Prevention and control of hemoglobinopathies in India, 2016
4. Phadke SR, Puri RD, Ranganath P. Prenatal screening for genetic disorders: Suggested guidelines for the Indian Scenario. The Indian Journal of Medical Research. 2017 Dec;146(6):689-699. DOI: 10.4103/ijmr.ijmr_1788_15. PMID: 29664026; PMCID: PMC5926339.
5. Gorivale M, Sawant P, Mehta P, Nadkarni A, Ghosh K, Colah R, et al. Challenges in prenatal diagnosis of beta thalassaemia: Couples with normal HbA2 in one partner. Prenat Diagn. 2015;35:1353–7.
6. Grande, M., Arigita, M., Borobio, V., Jimenez, J.M., Fernandez, S. and Borrell, A. (2012), First-trimester detection of structural abnormalities and the role of aneuploidy markers. Ultrasound Obstet Gynecol, 39: 157-163. https://doi.org/10.1002/uog.10070

True prevention is not waiting for bad things to happen,
it's preventing things from happening in the first place ... ..

- Don McPherson

Immunization in Obstetrics and Gynaecology

Y M Mala[1], Sarah Fatima Siddiqui[2]
[1]Director-Professor, [2]Senior Resident, Department of Obstetrics and Gynecology
Maulana Azad Medical College and, Lok Nayak Hospital

Immunization is the process of stimulating a protective adaptive immune response against microbes by exposure to either non-pathogenic forms or components of the microbes. Therefore, encouraging and ensuring vaccination in women is a quintessential component of preventive care for women so as to immunize them against preventable diseases before and during pregnancy.[1,2] Here, we elaborate on immunization of women in obstetric and gynaecology.

The recommendations for vaccination during pregnancy according to CDC are listed in the Table 1.[3]

Table 1: Vaccines in obstetrics- CDC

Recommended before pregnancy (Preconceptional)	1. MMR 2. Hepatitis B
Recommended for routine use in pregnancy (Antenatal)	1. TdaP 2. Influenza 3. Covid vaccine
Recommended for special circumstances in pregnancy	1. Hepatitis A and B 2. Pneumococcal 3. Meningococcal 4. Travel Vaccination-Yellow fever 5. Zoonotic vaccine preventable diseases-Rabies
Contraindicated in pregnancy	1. BCG 2. MMR 3. Varicella 4. Herpes Zoster 5. HPV

Table 2: Vaccines in obstetrics- FOGSI

Vaccination before pregnancy	Catchup Vaccination 1. MMR 2. Varicella Sickle Cell Diseas/Splenectomy 1. Pneumococcal 2. Meningococcal 3. H. Influenza
Vaccination during pregnancy	1. Tdap 28-32 weeks 2. Influenza
Vaccination during pregnancy under special conditions	1. Yellow Fever Vaccine 2. Pneumococcal 3. Meningococcal 4. Hepatitis A 5. Hepatitis B 6. Typhoid

FOGSI (2020), recommendation for vaccination during pregnancy are similar to the recommendations as per CDC as stated in Table 2.

Td/Tdap in Pregnancy[4]

Td(Tetanus-diphtheria) vaccine has replaced Tetanus toxoid vaccine in pregnancy in Universal Immunization Program of India. Immunization schedule (Table-3) of Td is as follows:

Table 3: Immunization schedule-Td

Early in pregnancy	Td-1
4 weeks after Td-1	Td-2
Pregnant within 3 years of last pregnancy with both doses of Td received	Td-B

Tetanus and diphtheria(Adsorbed) vaccine is administered as 0.5 ml deep i.m. in upper arm. It is suggested that available TT is to be used first before starting use of Td.

TDAP VACCINE can prevent diphtheria and pertussis in neonate in addition to tetanus. It can be given at 7 years of age or older.[5] According to CDC, all pregnant women should get a dose of Tdap during every pregnancy, to protect the newborn from pertussis. Young infants are at increased risk for death from pertussis and are entirely dependent on passive immunization from maternal antibodies until the infant vaccine series is initiated at 6 weeks (pentavalent-1). It is one of the most cost-effective strategies in protecting the newborn/young infants from neonatal pertussis. Since maternal antipertusis antibodies are relatively short-lived, to maximize passive transfer to the fetus, a dose of Tdap is ideally given between 27 and 36 weeks gestation. However, if received early in pregnancy due to a sustained wound or community outbreak, then it is not to be repeated at 27-36 weeks.

Other than CDC, RCOG, ACOG and FOGSI have also recommended this vaccine in third trimester. However, Universal Immunisation Program of India advocates Td as of now.

Influenza Vaccine in Pregnancy

ACOG-2018 recommendation advocates women who are or will be pregnant during influenza season to receive an inactivated influenza vaccine as soon as it is available, during any trimester, (CDC and ACOG). Due to the high potential for morbidity, recommendation regarding postexposure prophylaxis has been given (75mg of Oseltamivir once daily for 10 days) – for pregnant women and those who are upto 2 weeks postpartum.[6] If Oseltamivir is unavailable, Zanamivir can be substituted, two inhalations once daily for 10 days.[6] FOGSI in 2019 recommended that INACTIVATED INFLUENZA VACCINE (Quadrivalent: Dosage- 0.5ml IM) can be given any time during pregnancy, and is very important to give between October and January. Table 4 describes the differences between Quadravalent and Trivalent influenza vaccines.

Table 4: Types of influenza vaccine

	Quadrivalent Vaccine	**Trivalent Vaccine**
Composition	Split virions-disruptions of viral membrane	Subunit-disruption of viral membrane and removal of interval subviral core
Response	Cellular and antibody response as core proteins are maintained	Only antibody response as core proteins are removed
No. of subtypes of influenza vaccine	2A and 2B	2A and 1B
Clinical efficiency	Better	Less effective

COVID Vaccine in Pregnancy

Pregnant women with COVID-19 are at increased risk for preterm birth and might be at added risk of other adverse pregnancy outcomes[7] including higher chances of neonatal morbidity.[8] Over and above pre-existing co-morbidities, advanced maternal age and high body mass index are risk factors for severe COVID-19 disease in pregnancy.[9]

According to MOHFW in India, three vaccines have received approval for restricted use in emergency situation at present. One of them is an inactivated vaccine (Covaxin) and two other are based on non-replicating viral vector platform (Covishield and Sputnik V).

A pregnant woman who opts for vaccination, could be vaccinated at anytime of pregnancy and lactation. As per the latest studies experts believe that COVID-19 vaccines are unlikely to pose a risk to the pregnant person or foetus.[10] According to The Royal College of Obstetricians and Gynecologists (RCOG) all pregnant women should be offered the vaccine as the general population.[11]

Vaccination in Special Conditions

Hepatitis A Vaccine (HAV)

CDC and ACOG have recommended that pregnant women at high risk of infection should receive HAV vaccine. Risk factors include travel to endemic areas, outbreaks and exposure to individuals with HAV infection. Vaccine available is HAVRIX, dosage is 1.0 ml IM, 2 doses given 6-12 months apart.

Hepatitis B Vaccine

HBV vaccination is the best preventive measure, including administration preconceptionally and during pregnancy. The 3 dose HBV vaccine (Recombivax 1.0 ml IM 0, 1, 6 months) series should be initiated for pregnant women who are at high risk and who have not been vaccinated previously. As per FOGSI, Hepatitis B vaccination during pregnancy is safe and does not warrant a termination.

Perinatal transmission prevention is done by identifying HBV infected pregnant mother and administration of hep B immunoglobulin and Heb B vaccine to newborn within 12 hours of birth. Further Antenatal Tenofovir is indicated if Hepatitis B viral load is more than 10,00,000/dl at 32 weeks of gestation.

Pneumococcal Vaccine

PNEUMOCOCCAL VACCINE (PPSV23) in the dose of 1 dose 0.5ml is indicated in high risk patients ie. women with heart disease, lung disease or sickle cell disease, Diabetic, Smoker. Single dose is sufficient for one season.

Meningococcal Vaccine

MENINGOCOCCAL VACCINE (MPSV4) Quadrivalent meningococcal conjugate vaccine(MPSV4) single 0.5ml, IM dose is given in the time of meningococcal outbreak.

Yellow Fever Vaccine

During pregnancy if a women travels (Africa and S.America) and her risk of exposure and infection is high enough to outweigh any potential theoretical risk of vaccination.

However Limited safety data is available in pregnancy.

It is a live attenuated vaccine and 0.5ml subcutaneous is given in Upper arm.

Rabies Vaccine

Rabies is nearly 100% fatal disease and there is no contraindication to Post exposure Prophylaxis. Pregnancy and lactation are no contraindications for rabies PEP in the event of an exposure. There is no adverse effect on pregnant woman, course of pregnancy, fetus or lactating mother. According to updated red cross regime doses are given on days 0,3,7 and 28 wherein two doses of 0.1ml are given on each day (total 8 doses, 4 visits)

Contraindicated Vaccines

1. CDC does not recommend administration of BCG vaccination (live attenuated) during pregnancy, even though no harmful effects of BCG vaccination have been observed on the fetus.
2. Pregnancy should be avoided for 30 days after MMR vaccination (overall theoretical risk of anomalies is up to 2.6%). However it is not an indication for pregnancy termination. It may be given to susceptible women postpartum, and breastfeeding is not a contraindication. The MMR Booster shot is a short live-attenuated vaccine. After a woman receives it, the CDC recommends waiting at least four weeks before attempting pregnancy because of theoretical risks to the fetus.
3. WHO and ACOG recommend avoiding HPV vaccination during pregnancy. However, when administered during pregnancy, it has not been associated with adverse pregnancy outcomes, including major malformations.
   - If administered inadvertently, termination of pregnancy should not be considered. True safety of HPV vaccination in pregnancy has yet not been established.
4. Varicella vaccine is not recommended for pregnant women or for those who may become pregnant within a month following each vaccine dose. Wild type varicella can cause congenital infection. The attenuated vaccine virus is not secreted in breast milk, and so postpartum vaccination can be given. An attenuated live-virus vaccine, Varivax, is recommended for nonpregnant adolescents and adults with no history of varicella: in two doses, 4 to 8 weeks apart.

Vaccines Under Research

1. GBS Vaccinne to protect the newborn against group B streptococcal infections through maternal immunization. It has been identified as a priority by WHO.[12]
2. RSV Vaccine: RSV can cause severe pneumonia and bronchiolitis, especially in infants less than 6 months of age. No licensed vaccine so far provides protection from it.[13]

Vaccination During Breastfeeding

Inactivated, subunit, recombinant, toxoids polysaccharide and conjugated vaccines pose no risk in pregnancy, and can also be given during breastfeeding. Majority of live viruses in vaccines have also not been demonstrated in human breast milk. Viral vaccines (both live and inactivated) administered to a breastfeeding woman do not affect the safety of breastfeeding for women or their infants. Lactation does not adversely affect the efficacy or the safety of the vaccination.

HPV Vaccine

Three different vaccines, which differ in the number of HPV types they contain and target, have been developed, although not all are available globally:

- Quadrivalent vaccine (Gardasil) targets HPV types ,6 16 ,11, and 18.
- Nanovalent vaccine (Gardasil 9) targets the same HPV types as the quadrivalent vaccine (16 ,11 ,6, and 18) as well as types 52 ,45 ,33 ,31, and 58.
- Bivalent vaccine (Cervarix) targets HPV types 16 and 18.

Recommended age for routine HPV vaccination is 11 to 12 years. It can even be administered starting at 9 years of age.

- For adolescents and young adults aged 13 to 26 years who have not been previously vaccinated or those have not completed the vaccine series, catch-up vaccination is recommended.
- For women aged 27 years and older, catch-up vaccination is not routinely recommended; the ACIP notes that the decision to vaccinate people in this age group should be made on an individual basis. For pregnant patients, HPV is not recommended during pregnancy due to limited data on safety.

Breastfeeding females can receive the immunization series since subunit vaccines do not affect the safety of infant breastfeeding.

References

1. Arunakumari PS, Kalburgi S, Sahare A. Vaccination in pregnancy. The Obstetrician & Gynaecologist 2015;17:257–63.
2. Guidelines for vaccination in normal adults in India. Indian J Nephrol. 2016;26(Suppl 1):S7-S14.
3. Centers for Disease Control and Prevention. General recommendations on immunization: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep 2011
4. National Immunization Schedule (NIS) for Infants, Children & Pregnant Women
5. Agrawal A, Singh S, Kolhapure S, Kandeil W, Pai R, Singhal T. Neonatal pertussis, an under-recognized health burden and rationale for maternal immunization: a systematic review of South and South-East Asian Countries. Infectious diseases and therapy. 2019 Jun;8(2):139-53.
6. Fiore AE, Fry A, Shay D, Gubareva L, Bresee JS, Uyeki TM. Antiviral agents for the treatment and chemoprophylaxis of influenza—recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Recomm Rep 2011;60(RR-1):1-24.
7. Wei SQ, Bilodeau-Bertrand M, Liu S, Auger N. The impact of COVID-19 on pregnancy outcomes: a systematic review and meta-analysis. CMAJ. 2021 Apr 19;193(16):E540-E548. doi: 10.1503/cmaj.202604. Epub 2021 Mar 19. PMID: 33741725; PMCID: PMC8084555.
8. Outcomes of Neonates Born to Mothers with Coronavirus Disease 2019 (COVID-19) – National Neonatology Forum (NNF) India COVID-19 Registry; early online version, Indian paediatrics
9. SAGE guidance for the development of evidence-based vaccination-related recommendations. Geneva: World Health Organization; 2017 (https://www.who.int/immunization/sage/Guidelines_development_recommendations.pdf, accessed 19 April 2021)
10. Interim Clinical Considerations for Use of COVID -19 Vaccines Currently Authorized in the United States; Centers for Disease Control and Prevention; Article Location
11. Royal College of Obstetricians and Gynecologists (RCOG). COVID -19 vaccines, pregnancy and breastfeeding. [Online] 16 April 2021.
12. Baker CJ, Rench MA, Edwards MS, Carpenter RJ, Hays BM, Kasper DL. Immunization of pregnant women with a polysaccharide vaccine of group B streptococcus. New England Journal of Medicine. 1988 Nov 3;319(18):1180-5.
13. Madhi SA, Polack FP, Piedra PA, Munoz FM, Trenholme AA, Simões EA, Swamy GK, Agrawal S, Ahmed K, August A, Baqui AH. Respiratory syncytial virus vaccination during pregnancy and effects in infants. New England Journal of Medicine. 2020 Jul 30;383(5):426-39.

IN THE FUTURE…..

WHO Labour Care Guide: New Update

Garima Maan[1], Shalini Shakarwal[2]
[1]Senior Resident, [2]Assistant Professor, Department of Obstetrics and Gynaecology MAMC & LNH

Introduction

In the past two decades, efforts have been made to encourage and support pregnant women to give birth in health facilities, where they ideally receive good-quality intrapartum care from skilled health personnel.[1]

The Labour Care Guide is designed to emphasise the importance of the experiential dimension of childbirth by requiring explicit recording of evidence-based practices that matter not only for women's positive birth experience but also for improving clinical outcomes for women and their newborns.[2]

The new WHO recommendations included in labour care guide is based on the emerging evidence on normal labour progression, as well as recommendations informed by the global shift towards improving experience of childbirth, that necessitated the design of a new labour monitoring tool called the WHO Labour Care Guide.[3]

Why We Need Labor Care Guide Instead of Partograph?

In 2018 the WHO initiated a process to revise the partograph in light of recent evidences which are:

- Understanding of the individual variability of the progress of labours resulting in good perinatal outcomes
- Many women do not experience a labour that conforms to the average rate on which the partograph design was based.
- Failing to find evidence to support the use of a cervical dilatation rate of 1 cm/hour as a screening tool to predict adverse labour outcomes.
- Emerging evidence on normal labour progression, as well as recommendations informed by the global shift towards improving experience of childbirth.
- Respectful maternity care.

The Labour Care Guide[1]

The principal aims of the LCG are to:

- Guide the monitoring and documentation of the well-being of women, babies and the progress of labour
- Guide skilled health personnel to offer supportive care throughout labour to ensure a positive childbirth experience for women
- Assist skilled health personnel to promptly identify and address emerging labour complications, by providing reference thresholds for labour observations that are intended to trigger reflection and specific action(s) if an abnormal observation is identified
- Prevent unnecessary use of interventions in labour
- Support audit and quality improvement of labour management

For Whom should The LCG be Used?[1]

The LCG has been designed for the care of women and their babies during labour and childbirth. It includes assessments and observations that are essential for the care of all pregnant women, regardless of their risk status. Women at high risk of developing labour complications may require additional specialized monitoring and care

When should The LCG be Initiated?[1]

Documentation of the well-being of the woman and her baby as well as progression of labour, on LCG, should be initiated when the woman enters active phase of the first stage of labour (5 cm or more cervical dilatation), regardless of her parity and membranes status.

Where should the LCG be Used?[1]

The LCG is designed to be used for all births in health facilities, including primary, secondary and tertiary care settings.

The LCG has seven sections, which were adapted from the previous partograph design. The sections are as follows (see Fig. 1):

1. Identifying information and labour characteristics at admission
2. Supportive care
3. Care of the baby
4. Care of the woman
5. Labour progress
6. Medication
7. Shared decision-making

How to use The Labour Care Guide[1]

Labour Monitoring to Action

To ensure the systematic and consistent application of the LCG, health providers are encouraged to use the Assess, Record, Check, Plan approach, which involves:

- Assess (assess the well-being of woman and her baby, and progress of labour)
- Record (document labour observations)
- Check reference threshold (compare labour observations with reference values in the "Alert" column)
- Plan (decide whether and what interventions are required, in consultation with the woman, and document accordingly)

What has Changed in Labour Care Guide[4]?

As compared with the previous partograph designs, the Labour Care Guide includes the following changes:

- The 1 cm/hour 'alert' line and its corresponding 'action' line have been replaced with evidence-based time limits at each centimetre of cervical dilatation during active first stage of labour; the starting point of active first stage of labour is a cervical dilatation of 5 cm (instead of 4 cm or less)
- Normal progress of labor which was taken as cervical dilatation of 1 cm/hour is not considered as it does not account for the variability in the rates of progression between women.
- It differs fundamentally in that the guiding parameters for labour progress are dynamic as opposed to being static as in partograph. Rather than having a fixed-rate limit over the entire active first stage of labour, consideration for intervention is guided by an evidence-based time limit for each centimetre of cervical dilatation.
- The absence of the diagonal labour progress limit lines is the most striking difference between the Labour Care Guide and the partograph.
- The Labour Care Guide includes assessment of labour companionship, oral hydration, maternal position and mobility, and pain management, with the aim of promoting the use of these evidence-based yet often neglected practices.
- Inclusion of second stage of labour is very important feature as increased uterine activity compounded by maternal expulsive efforts make the second stage of labour a particularly critical time, and reduced vigilance at this time may lead to poor outcomes

Advantages of Labour Care Guide Over Modified WHO Partograph[5]

Modified WHO partograph	WHO Labour Care Guide
Active phase defined as starting from 4 cm of cervical dilatation	Active phase defined as starting from 5 cm of cervical dilatation
Fixed 1 cm/hour 'alert' line and 'action' lines	Evidence-based time limits at each centimetre of cervical dilatation
No second-stage section	Intensified monitoring in second stage
No recording of supportive care interventions	Explicit recording of labour companionship, pain relief, oral fluid intake and posture
Records strength, duration and frequency of uterine contractions	Records duration and frequency of uterine contractions
No explicit requirement to respond to deviations from expected observations of any labour parameter, other than cervical dilatation alert and action lines	Requires deviations to be highlighted and the corresponding response to be recorded by the provider

As a redesigned WHO partograph, the LCG has the potential to promote woman-centered care and continuous assessment and decision-making throughout labor. Implementing the LCG should be accompanied by the necessary initial and ongoing training, supportive supervision and strategies to promote an enabling environment for practitioners to use LCG efficiently.[2]

Care Throughout Labour and Birth Recommendations[1]

- **Respectful maternity care:** refers to care organized for and provided to all women in a manner that maintains their dignity, privacy and confidentiality, ensures freedom from harm and mistreatment, and enables informed choice and continuous support during labour and childbirth – is recommended

- **Effective communication:** Effective communication between maternity care providers and women in labour, using simple and culturally acceptable methods is recommended
- **Companionship:** A companion of choice is recommended for all women throughout labour and childbirth
- **Continuity of care:** Midwife-led continuity-of-care models, in which a known midwife or small group of midwives supports a woman throughout the antenatal, intrapartum and postnatal continuum, are recommended in settings with well-functioning midwifery programmes

The picture given below is the format of Labour care guide:

Bibliography

1. World Health Organization, 2020. WHO labour care guide: user's manual.
2. Vogel JP, Comrie-Thomson L, Pingray V, Gadama L, Galadanci H, Goudar S, Laisser R, Lavender T, Lissauer D, Misra S, Pujar Y. Usability, acceptability, and feasibility of the World Health Organization Labour Care Guide: A mixed-methods, multicountry evaluation. Birth. 2021 Mar;48(1):66-75.
3. Pingray V, Bonet M, Berrueta M, Mazzoni A, Belizán M, Keil N, Vogel J, Althabe F, Oladapo OT. The development of the WHO Labour Care Guide: an international survey of maternity care providers. Reproductive health. 2021 Dec;18(1):1-9.
4. G. Justus Hofmeyr,WHO next generation partograph: revolutionary steps towards individualised labour care, BJOG An International Journal of Obstetrics & Gynaecolog, sept 2021:10.1111/1471-0528.16694
5. Maaløe N, van Roosmalen J, Dmello B, Kwast B, van den Akker T, Housseine N, Kujabi M, Meguid T, Kidanto H. WHO next-generation partograph: revolutionary steps towards individualised labour care?. BJOG: An International Journal of Obstetrics & Gynaecology. 2021 Sep 14.

WHO LABOUR CARE GUIDE

Name **Parity** **Labour onset** **Active labour diagnosis [Date**]

Ruptured membranes [Date **Time**] **Risk factors**

			Time	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
			Hours	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
			ALERT	← ACTIVE FIRST STAGE →												← SECOND STAGE →		
SUPPORTIVE CARE	Companion	N																
	Pain relief	N																
	Oral fluid	N																
	Posture	SP																
BABY	Baseline FHR	<110, ≥160																
	FHR deceleration	L																
	Amniotic fluid	M+++, B																
	Fetal position	P, T																
	Caput	+++																
	Moulding	+++																
WOMAN	Pulse	<60, ≥120																
	Systolic BP	<80, ≥140																
	Diastolic BP	≥90																
	Temperature °C	<35.0, ≥ 37.5																
	Urine	P++, A++																
LABOUR PROGRESS	Contractions per 10 min	≤2, >5																
	Duration of contractions	<20, >60																
	Cervix [Plot X]	10																
		9	≥ 2h															
		8	≥ 2.5h															
		7	≥ 3h															
		6	≥ 5h															
		5	≥ 6h															
	Descent [Plot O]	5																
		4																
		3																
		2																
		1																
		0																
MEDICATION	Oxytocin (U/L, drops/min)																	
	Medicine																	
	IV fluids																	
SHARED DECISION-MAKING	ASSESSMENT																	
	PLAN																	
	INITIALS																	

In active first stage, plot 'X' to record cervical dilatation. Alert triggered when lag time for current cervical dilatation is exceeded with no progress. In second stage, insert 'P' to indicate when pushing begins.

INSTRUCTIONS: CIRCLE ANY OBSERVATION MEETING THE CRITERIA IN THE 'ALERT' COLUMN, ALERT THE SENIOR MIDWIFE OR DOCTOR AND RECORD THE ASSESSMENT AND ACTION TAKEN.IF LABOUR EXTENDS BEYOND 12H, PLEASE CONTINUE ON A NEW LABOUR CARE GUIDE.

Abbreviations: **Y** – Yes, **N** – No, **D** – Declined, **U** – Unknown, **SP** – Supine, **MO** – Mobile, **E** – Early, **L** – Late, **V** – Variable, **I** – Intact, **C** – Clear, **M** – Meconium, **B** – Blood, **A** – Anterior, **P** – Posterior, **T** – Transverse, **P+** – Protein, **A+** – Acetone

Newborn Screening: Dried Blood Spot

Aashima Dabas[1], Meenakshi Bothra[2], Seema Kapoor[3]
[1]Associate Professor, [2]Assistant Professor, [3]Director Professor
Department of Pediatrics, Maulana Azad Medical College and Lok Nayak Hospital, New Delhi

Introduction

Screening is defined as identification of unrecognized disease or defects by rapidly applied tests in apparently healthy individuals on a large scale.[1] Newborn screening (NBS) is the practice of screening newborns shortly after birth for potentially fatal disorders that are treatable, but difficult or impossible to detect clinically. It is a coordinated comprehensive system consisting of education, screening (specimen Taking, transportation and testing), follow- up of abnormal and unsatisfactory test results, confirmatory testing and diagnosis, timely appropriate management and periodic outcome evaluation, quality assurance and program evaluation, validity of testing systems, efficiency of follow-up and intervention, and assessments of long-term benefits to individuals, families and society.[2] Most of the disorders which are targeted under NBS may be difficult to diagnose at birth and can lead to severe debilitating complications/ mortality in the absence of correct diagnosis. Newborn screening can help to identify these disorders in the pre-symptomatic phase, thus reducing their burden of morbidity and mortality.[3,4]

Dried Blood Spot

Ivar Christian Bang (1869 – 1918), the father of modern clinical microanalysis was the first to demonstrate the clinical use of filter papers for measurement of glucose. After this discovery, dried filter paper based blood spots have been useful for detection of different analytes, toxins and drugs in toxicology and microbiological diagnosis.[5] At present, a special type of filter paper is used to collect blood samples from newborns for NBS.

The following steps need to be followed for collection of DBS sample in newborns:

A. ***Prepare the supplies-*** The filter paper card (**Figure 1**) with key demographic data of the babies, a lancet (maximum tip length 2.4 mm), sterile swab, sterile guaze and gloves should be prepared before sampling. A barcode can be generated with patient identification and can be pasted on the filter paper.

B. ***Prepare the sampling site***- The ideal recommended site for sampling in a newborn is the heel. The lateral borders of the heel should be cleaned for sampling taking care to avoid the central part (**Figure 2A**). The site should be cleaned and warmed and held with a sterile guaze before collecting the sample. It can be warmed by rubbing against hands, warming with a warm towel etc.

C. ***Collect blood***- The sampling site is pricked with the lancet and heel is squeezed till a drop of blood can form (time taken around 5 seconds). One drop of blood is dabbed against the filter paper against marked circles to fill these uniformly. The following precautions should be taken during collection (**Figure 2B**):

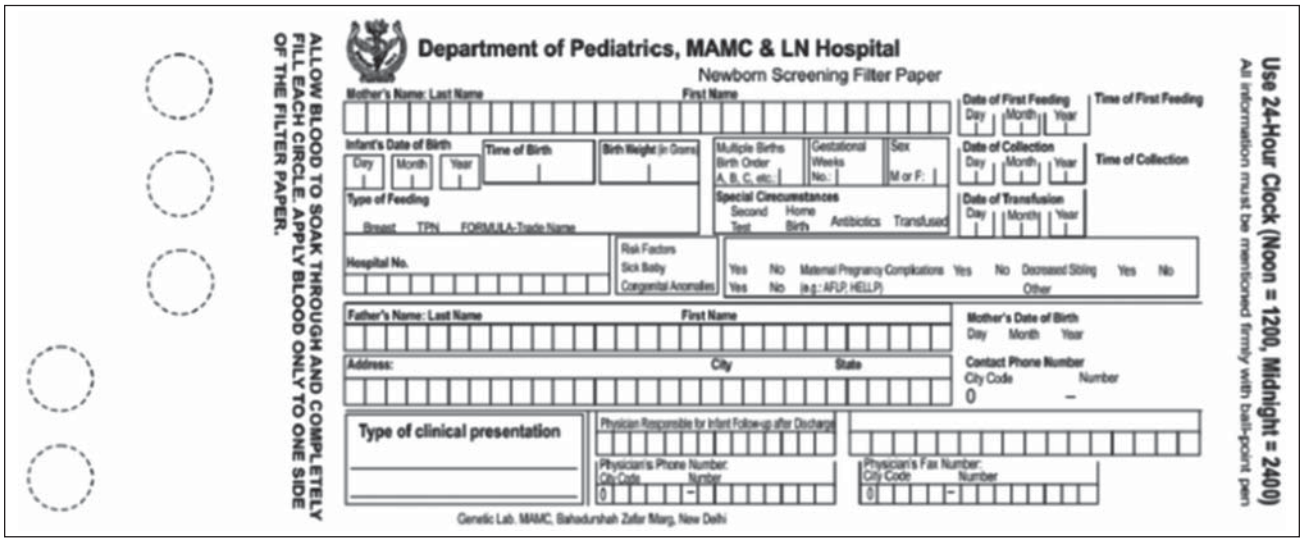


Figure 1: Filter paper for Dried Blood Spots

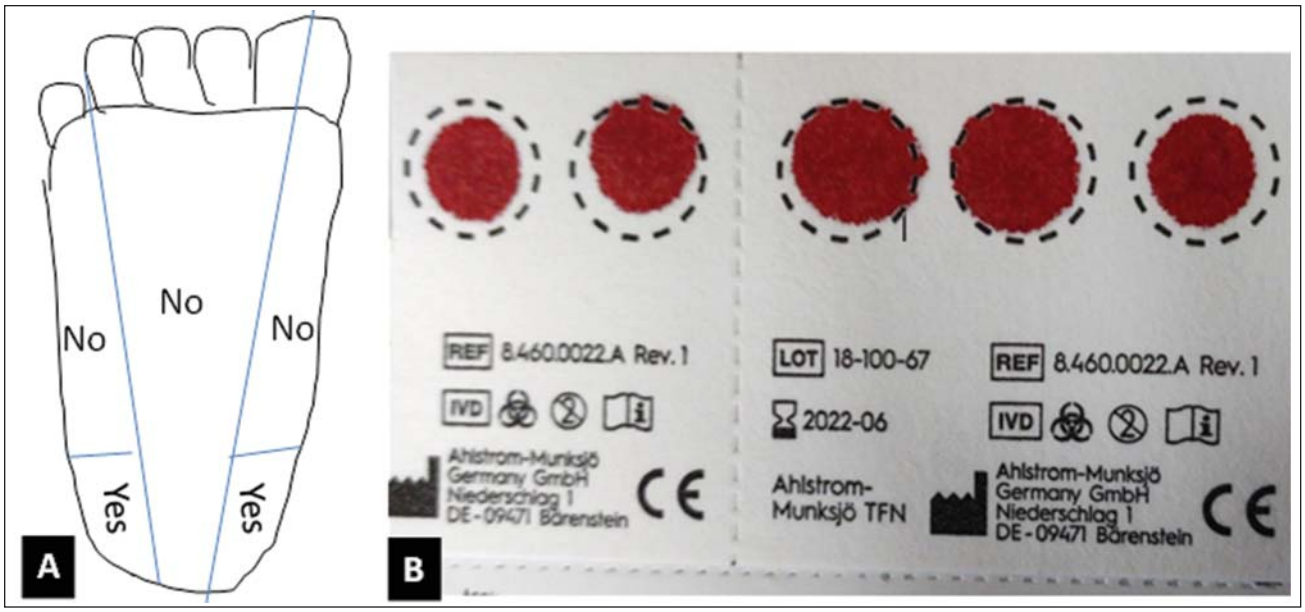


Figure 2: A: Site of blood sampling; B: Adequately collected DBS

i. Wait to collect the sample till a good volume blood drop is formed and the rub the card against the hanging drop
ii. Fill each circle with a single drop only
iii. Do not dab/wipe the filter with repeated drops of blood
iv. Collect at least three (preferably five) blood spots from each neonate
v. The depth of the puncture should not exceed 2.4 mm, which is ensured using a lancet
vi. If a second puncture is necessary, this is made a few millimeters away from the first or in other foot
vii. The blood sport should not be touched with the finger

D. Dry and pack the card- The filter paper should be dried completely before packing inside an envelope by leaving it exposed to air at room temperature. The use of heat, air blower etc is not recommended for this purpose.

E. Transport: The filter paper with DBS is a potential biocontaminant which require safe transport. Few blood analytes are susceptible to extreme temperature fluctuations. The DBS should therefore be transported in thermocol boxes or biosafety cabinets till the main laboratory.

F. Measurement of analytes – The DBS cards are punched using automated machines into small circles which are then processed for measurement of different analytes.

The main advantages and limitations of using a DBS are mentioned in **Table I** below:

Table 1: Advantages and disadvantages of Dried Blood Spots

Advantages
Requires less blood volume- better acceptance in neonatal screening
Simple and less invasive procedure over intravenous blood sampling
Minimal risk of bacterial contamination or hemolysis
Can be preserved for long periods
Can be used to collect samples in field settings
Disadvantages
Can only measure analytes from serum
Requires temperature control for transportation
Logistic concerns of equipment for processing and measuring the analytes

Newborn Screening for Metabolic Disorders

Phenylketonuria was the first metabolic disorder which was screened in 1960s. As more and more enzyme assays were developed, NBS for **congenital hypothyroidism** was made possible using TSH and later T4 in the 1970s. Screening for other endocrinal disorders namely **congenital adrenal hyperplasia** was developed by 1978. Most of the developed countries now have universal NBS program with services extended to screen for **cystic fibrosis, primary immunodeficiency, G6PD deficiency, galactosemia** and other inborn errors of metabolism.[2,6]

The prevalence of congenital adrenal hyperplasia (CAH)

in India is reported 1 in 5762 babies as per NBS data and overall prevalence of congenital hypothyroidism (CH) was 1 in 722 births or 1:1130 births after excluding those with transient hypothyroidism.[3,7] Universal newborn screening for treatable genetic disorders like congenital hypothyroidism and congenital adrenal hyperplasia, however, has still not seen the light of the day in India. Newborn screening in India is only done in a project mode, in specific medical facilities, cities or states, intermittently.[8,9] The major challenges associated with NBS include a large birth cohort, unattended deliveries which are still common in India, lack of awareness, financial implications and absence of uniform screening guidelines makes it a challenging and arduous task to implement universal NBS. The current coverage of NBS in India is approximately 2%, with only few states like Kerala and Tamil Nadu advocating universal screening.[9] The NBS program was launched in Kerala in 2012 which screens for four disorders including **congenital hypothyroidism, CAH, Glucose 6 phosphate dehydrogenase deficiency and Galactosemia.** Since then, the program has grown to screen more than 140,000 births per year in over 90 government hospitals of Kerala.[9]

To promote the early detection and management of childhood disorders, the Government of India launched the Rashtriya Bal Suraksha Karyakram (RBSK) in 2013, which aimed to screen over 270 million children from 0 to 18 years for 4 Ds - Defects at birth, Diseases, Deficiencies and Development Delays including Disabilities. The Delhi government recently launched its flagship health programme under the vision of Rashtriya Bal Swasthya Karyakram (RBSK) called as **Mission NEEV (Neonatal Early Evaluation Vision) to provide universal newborn screening for congenital hypothyroidism and congenital adrenal hyperplasia, early diagnosis of visible birth defects, critical congenital heart diseases and hearing loss.** The program is being launched at 31 major birthing facilities of the city and will be expanded later to all delivery points and other birthing facilities.[10,11]

For every screen positive baby, it is mandatory to perform confirmatory biochemical and molecular testing. These tests should be performed at an appropriate healthcare facility in consultation with a specialist after proper counselling of the parents/ caregivers. In some disorders (like hemoglobinopathies) establishment of a correct diagnosis might involve testing the parents and/or other siblings as well. This implies that recall rates will be high for any screening test to ensure a positive baby is not missed.

Conclusion

Newborn screening (NBS) is a simple, inexpensive, yet an effective method to identify potentially life-threatening conditions in pre-symptomatic neonates, enabling early treatment/institution of therapy. NBS has been demonstrated to save lives and prevent serious disability. It appears to be cost-effective and represents a public health success in most developed nations. Public awareness coupled with professional training and family education must be a part of the complete NBS system. Hence, it is important that Universal screening should be implemented as a programme at the earliest

References

1. Pitt JJ. Newborn screening. Clin Biochem Rev. 2010;31(2):57-68.
2. Therell BL, Padilla CD, Loeber JG, Kneisser I, Saadallah A, Borrajo GJ, et al. Current status of Newborn Screening worldwide:2015. SeminPerinatol. 2015;39(3):171-87.
3. ICMR Task Force on Inherited Metabolic Disorders. Newborn Screening for Congenital Hypothyroidism and Congenital Adrenal Hyperplasia. Indian J Pediatr. 2018;85(11):935-940.
4. Verma IC1, Bijarnia-Mahay S, Jhingan G, Verma J. Newborn screening: need of the hour in India. Indian J Pediatr. 2015;82(1):61-7.
5. Demirev PA. Dried Blood Spots: Analysis and Applications. *Anal. Chem.* 2013; 85(2):779–789
6. Bodamer OA, Hoffman GF, Lindner M. Expanded Newborn Screening in Europe: the situation in Europe 2007. J Inherit Metab Dis. 2007;30(4)439-444.
7. Vats P, Dabas A, Jain V, Seth A, Yadav S, Kabra M, et al. Newborn Screening and Diagnosis of Infants with Congenital Adrenal Hyperplasia. Indian Pediatr. 2020; 57:49–55.
8. Dabas A, Bothra M, Kapoor S. CAH Newborn Screening in India: Challenges and Opportunities. Int J Neonatal Screen. 2020;6(3):70.
9. Kaur G, Srivastav J, Jain S, Chawla D, Chavan BS, Atwal R, et al. Preliminary report on neonatal screening for congenital hypothyroidism, congenital adrenal hyperplasia and glucose-6-phosphate dehydrogenase deficiency: a Chandigarh experience. Indian J Pediatr. 2010; 77: 969–73.
10. Delhi Govt Launches 'Mission NEEV' for Early Treatment of Infants. https://theindianpractitioner.com/2020/01/08/delhi-govt-launches-mission-neev-for-early-treatment-of-infants/. Accessed on 12 Jan 2021.
11. Health and Family Welfare, Government of NCT Delhi. http://delhiplanning.nic.in/sites/default/files/16%29%20Health%20%26%20FW.pdf. Accessed on 12 Jan 2021.

Newborn Screening: Point of Care Testing

Rajesh Verma[1], Meenakshi Bothra[2], Aashima Dabaas[3], Ranjana Mishra[4], Seema Kapoor[5]
[1]Senior Resident, [2,3]Assistant Professor, [4]Medical Officer, Genetic Lab, [5]Director Professor
Department of Pediatrics, Maulana Azad Medical College and Associated Lok Nayak Hosspital

Introduction

Newborn screening for common metabolic and genetic disorders should be an essential part of neonatal care as early detection and treatment can help prevent intellectual and physical defects and life threatening illnesses.[1] Conditions for which screening is done differ from country to country, based on the prevalence of the condition and available resources. Universal screening for about 40 to 50 metabolic disorders is mandatory in US, Europe and many other countries across the world. Though universal screening is a cost-intensive exercise, the benefits far surpass the cost as it helps in reducing the mortality and morbidity of these diseases. Point-of-care (POC) testing refers to those tests performed and interpreted outside of a laboratory but close to the site of direct delivery of medical care for a patient.[2] POC testing has been widely used in the developed world to screen for disorders with high prevalence and public health importance like hearing loss and critical congenital heart diseases, the timely detection of which can facilitate appropriate management and cause significant decrease in infant and child morbidity as well as mortality.[3]

POC Screening for Hearing Loss

Congenital hearing impairment occurs in approximately 1 to 5 per 1000 live births and when permanent unilateral hearing loss is included, the incidence increases to 8 per 1000 live births.[4] Neonatal hearing loss has a prevalence that is more than twice that of other newborn disorders detectable by screening such as congenital hypothyroidism and phenylketonuria.[5] Studies done in India using different hearing screening protocols have estimated the prevalence of neonatal hearing loss to vary between 1 and 8 per 1000 babies screened. Early identification and treatment for hearing loss by 6 months of age provides better prognosis in language development, academic success, social integration and successful participation in the society.[6]

In October 2007 the Joint Committee on Infant Hearing (JCIH) issued its eighth position statement, which continues to endorse the early hearing detection and intervention (EHDI) for infants with hearing loss with the overall goal of maximizing their linguistic competence and literacy development. The 2007 statement continues to follow the "*1-3-6 EHDI Plan*" according to which-(i) All infants should have access to hearing screening using a physiologic measure at no later than 1 month of age, (ii) All infants who do not pass the initial hearing screening and the subsequent rescreening should have appropriate audiological 8and medical evaluations to confirm the presence of hearing loss at no later than 3 months of age, (iii) All infants with confirmed permanent hearing loss should receive early intervention services as soon as possible after diagnosis but at no later than 6 months of age.[7]

POC tests widely used for screening infants for hearing loss include Oto-acoustic emissions (OAE) and automated Auditory Brainstem Response audiometry (AABR). While OAE is cost effective, quick, simple and reliable with a sensitivity of 100% and specificity of 99%, AABR has the additional advantage of identifying neonates with auditory neuropathy unlike testing for OAE, and is especially useful for babies requiring neonatal intensive care unit (NICU), with multiple co-morbidities. The other advantages of AABR include rapidity, easy-to-use and high sensitivity (0.99) and specificity (0.87)

In a study conducted by Kumar et al. between Jan 2007 and Mar 2016 a total of 30,600 neonates were screened using Newborn Hearing Screening. Out of the 75 neonates who failed screening, 58 babies had a false positive result and passed the test after a week. Out of the true positive17 babies, 8 infants had hearing difficulties requiring treatment by an ENT Surgeon.[9]

Hence, hearing screening of apparently well newborns should become a standard of care in India like many other developed countries.

Screening for Critical Congenital Heart Defects (CCHD)

Congenital heart disease (CHD) is the most frequently occurring congenital disorder, responsible for 28% of all congenital birth defects[10], The birth prevalence of CHD is reported to be 8-12/1000 live births.[11] Considering a

rate of 9/1000, about 1.35 million babies are born with CHD each year globally.[12]

In 2011, the US Secretary of Health and Human Services Advisory Committee on Heritable Disorders in Newborns and Children (SACHDNC) recommended that newborns be screened for critical congenital heart disease (CCHD) by pulse oximetry. This recommendation was made on the basis of evidence of the effectiveness of screening and the benefit of early intervention in improving child health.[13]

Newborn screening for critical congenital heart defects (CCHD) was added to the US Recommended Uniform Screening Panel in 2011. Within 4 years, 46 states and the District of Columbia had adopted it into their newborn screening program, leading to CCHD screening being nearly universal in the United States. This rapid adoption occurred while there were still questions about the effectiveness of the recommended screening protocol and barriers to follow-up for infants with a positive screen. In response, the Centers for Disease Control and Prevention (CDC) partnered with the American Academy of Pediatrics (AAP) to form an expert panel between January and September 2015 representing a broad array of primary care, neonatology, pediatric cardiology, nursing, midwifery, public health, and advocacy communities.[14]

Pulse oximetry screening should be ideally done at ≥24 hours, but it may be done even at <24 hours of life, if discharge of the baby from hospital has been planned early. Any pulse oximeter screening with an oxygen saturation measure that is ≥95% in the right hand or foot with a ≤3% absolute difference between the right hand or foot is considered a 'passed' screen. A screen is considered 'failed' if: (i) Any oxygen saturation measure is <90% (in the initial screen or in repeat screens), (ii) Oxygen saturation is <95% in the right hand and foot on three measures, each separated by one hour, (iii)>3% absolute difference exists in oxygen saturation between the right hand and foot on three measures, each separated by one hour. Any infant who fails the screen should have an evaluation for causes of hypoxemia. In most cases this will include an echocardiogram, but if a reversible cause of hypoxemia is identified and appropriately treated, an echocardiogram may not be necessary. Concerned pediatrician should be notified immediately and the infant might need to be seen by a pediatric cardiologist.[15] While it is true that pulse oximeter screening will allow detection of many more newborns with CCHD, it is necessary to carefully consider the implications of population-wide screening, particularly in low-resource environments, where making cardiac catheterisation based interventions and / or surgeries for the babies diagnosed with CCHD still remains a bottleneck.

In the Indian state of Kerala, every baby born in government facility is being screened for CCHD according to AAP guidelines, since 2018.[16] A large number of babies with critical CHD have been identified and managed according to the protocol developed by the State Government resulting in a significant decrease in the neonatal and infant mortality rates in the state, providing a template for the other states to emulate.

Conclusion

POC screening tests for hearing loss and CCHD, which are relatively easier to implement must be incorporated in the newborn screening programme, wherever feasible. Early identification of these disorders and timely intervention can prevent death or disability among the screened neonates and infants and enable them to reach their full potential, as they grow.

References

1. Boyle CA, Bocchini JA, Kelly J. Reflections on 50 years of newborn screening. Pediatrics. 2014 Jun;133(6):961–3.
2. Price CP. Point of care testing. BMJ. 2001 May 26;322(7297):1285–8.
3. Dubay K, Zach T. Newborn Screening. StatPearls [Internet]. 2021 Sep 5 [cited 2021 Nov 17]; Available from: https://www.statpearls.com/ArticleLibrary/viewarticle/25867
4. Mehra S, Eavey RD, Keamy DG. The epidemiology of hearing impairment in the United States: newborns, children, and adolescents. Otolaryngol--Head Neck Surg Off J Am Acad Otolaryngol-Head Neck Surg. 2009 Apr;140(4):461–72.
5. Fisher DA, Dussault JH, Foley TP, Klein AH, LaFranchi S, Larsen PR, et al. Screening for congenital hypothyroidism: results of screening one million North American infants. J Pediatr. 1979 May;94(5):700–5.
6. Mason JA, Herrmann KR. Universal infant hearing screening by automated auditory brainstem response measurement. Pediatrics. 1998 Feb;101(2):221–8.
7. Early Hearing Detection and Intervention [Internet]. American Speech-Language-Hearing Association. American Speech-Language-Hearing Association; [cited 2021 Nov 17]. Available from: https://www.asha.org/articles/early-hearing-detection-and-intervention/
8. Iwasaki S, Hayashi Y, Seki A, Nagura M, Hashimoto Y, Oshima G, et al. A model of two-stage newborn hearing screening with automated auditory brainstem response.

Int J Pediatr Otorhinolaryngol. 2003 Oct;67(10):1099–104.

9. Kumar RK. Routine newborn hearing screening – an Indian experience. Int J Pregnancy Child Birth [Internet]. 2016 Nov 16 [cited 2021 Nov 16];Volume 1(Issue 1). Available from: https://medcraveonline.com/IPCB/IPCB-01-00004.pdf
10. Dolk H, Loane M, Garne E, null null. Congenital Heart Defects in Europe. Circulation. 2011 Mar 1;123(8):841–9.
11. Bernier P-L, Stefanescu A, Samoukovic G, Tchervenkov CI. The challenge of congenital heart disease worldwide: epidemiologic and demographic facts. Semin Thorac Cardiovasc Surg Pediatr Card Surg Annu. 2010;13(1):26–34.
12. Hoffman JI. Incidence of congenital heart disease: I. Postnatal incidence. Pediatr Cardiol. 1995 Jun;16(3):103-13.
13. Kemper AR, Mahle WT, Martin GR, Cooley WC, Kumar P, Morrow WR, et al. Strategies for implementing screening for critical congenital heart disease. Pediatrics. 2011 Nov;128(5):e1259-1267.
14. Oster ME, Aucott SW, Glidewell J, Hackell J, Kochilas L, Martin GR, et al. Lessons Learned From Newborn Screening for Critical Congenital Heart Defects. Pediatrics [Internet]. 2016 May 1 [cited 2021 Nov 16];137(5). Available from: https://doi.org/10.1542/peds.2015-4573
15. CDC. Congenital Heart Defects Information for Healthcare Providers | CDC [Internet]. Centers for Disease Control and Prevention. 2019 [cited 2021 Nov 17]. Available from: https://www.cdc.gov/ncbddd/heartdefects/hcp.html
16. Hridyam for little hearts [Internet]. [cited 2021 Nov 18]. Available from: https://hridyam.kerala.gov.in/

Women Pathbreakers

Poonam Kashyap
Assistant Professor, Department of Obstetrics and Gynecology, Maulana Azad Medical College and Lok Nayak Hospital, Delhi

'These inspiring women endured poverty and deep rooted stereotypes but they never stopped and went on to achieve great heights in their fields.

One revolutionised the field of viral oncology, the other devised ways to assess and protect the health of newborns, both dramatically improving the health of millions'.

Sarah Stewart: *the women who revealed a missing link between virus and cancer*

Stewart was born on August 16, 1906 in the state of Jalisco, Mexico. She began doctoral work at the University of Colorado School of Medicine in Denver in 1933. Two years into her doctoral studies, She took a position of research assistant at the National Institutes of Health and became the first woman scientist to work at the Public Health Services. Stewart was a pioneer in the field of viral oncology and demonstrated the basis that cancer causing viruses can spread from animal to animal. She and Bernice Eddy co-discovered the first polyoma virus, and Stewart-Eddy polyoma virus is named after them. It was her effort and initial work of understanding oncogenic viruses that led to the development of HPV vaccine.

Virginia Apgar

She was an American physician, obstetrical anaesthesiologist and medical researcher, best known as the inventor of the Apgar Score. She graduated from the College of Physicians and Surgeons at Columbia University in 1933. Virginia Apgar devised newborn's Apgar score in 1953, creating the first tool to scientifically assess a neonate's health risks and need for potentially life-saving observation. During the rubella pandemic of 1964–65, she advocated the use of universal vaccination to prevent mother-to-child transmission of rubella. Apgar also emphasized the use of Rh testing to identify at risk women who can transfer antibodies across placenta and destroy fetal RBCs leading to fetal hydrops. She conducted various workshops to highlight the importance of early detection of birth defects and the need for more research in this area.

Quiz - Preventive Care in Obstetrics

Reena Rani
Assitant Professor, Department of Obstetrics and Gynaecology, MAMC

Q1. Gardasil 9 vaccine provides known protection against all HPV except

a. 31
b. 33
c. 16
d. 15

Q2. Mentzer index is

a. MCV/RBC
b. MCHC/HB
c. HB/MCV
d. MCV/HGB

Q3. Which of the following confirmed values meet the diagnostic threshold for diabetes?

a. fasting blood glucose 100 mg/dl
b. random glucose > 160 mg/dl
c. 2 hour post prandial glucose ≥ to 126 mg/dl
d. fasting blood glucose ≥ 126 mg/dl

Q4. Only intervention which has proved its role in prevention of preterm labour in women with prior history of spontaneous preterm labour and ultrasound suggestive of normal cervical length at 20 week of gestation

a. Cervical cerclage
b. Magnesium sulfate
c. Progesterone supplementation
d. Bedrest

Q5. Risk of miscarriage in amniocentesis after 15 weeks is

a. 1 in 1000
b. 1 in 10000
c. 1 in 100
d. 1 in 10

Q6. 6X6X6 STRATEGY is related to

a. Newborn screening
b. Prevention of anemia
c. Prevention of hypothyroidism
d. None of the above

Q7. Minimum time gap required between conception and measles vaccination is

a. 1 month
b. 2 month
c. 3 month
d. 4 month

Q8. Spinal Muscular Dystrophy is

a. Autosomal dominant
b. X-linked dominant
c. Autosomal recessive
d. X-linked recessive

Q9. The father of modern clinical microanalysis is

a. Ivar Christian Bang
b. Károly Ereky
c. Francis Galton
d. Antoni van Leeuwanhoek

Q10. A newborn screen suggestive of classical galactosemia will have _____ galactose -1- phosphate uridylytransferase (GALT) enzyme and _____ erythrocyte galactose-1-phosphate concentration.

a. Elevated, reduced
b. Reduced, elevated
c. Normal, reduced
d. reduced, reduced

Q11. Detection rate of preeclampsia via universal screening tool (MAP,uterine artery PI,PLGF) is

a. 90-93%
b. 70-80%
c. 50-63%
d. 30-40 %

Q12. POSHAN Abhiyan started on

a. 8th march 2016
b. 8th march 2018
c. 8th may 2019
d. 8th may 2020

Q13. Mission NEEV (Neonatal Early Evaluation Vision) envisages to provide universal newborn screening for

a. congenital hypothyroidism
b. congenital adrenal hyperplasia
c. critical congenital heart diseases
d. All of the above

Q14. WHO Labour Care Guide includes:

a. Supportive care
b. Care of baby and mother
c. Labour progress
d. All of above

Q15. For Newborn screening by DBS method, blood is usually taken from

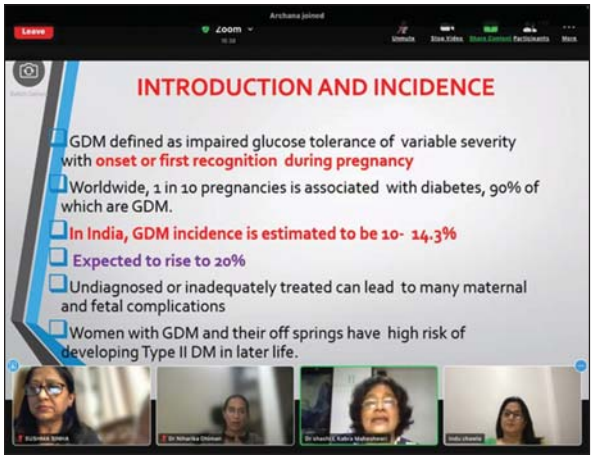
a. Center of heel
b. Lateral part of heel
c. Prominent vein on dorsum of hand
d. Forearm fold

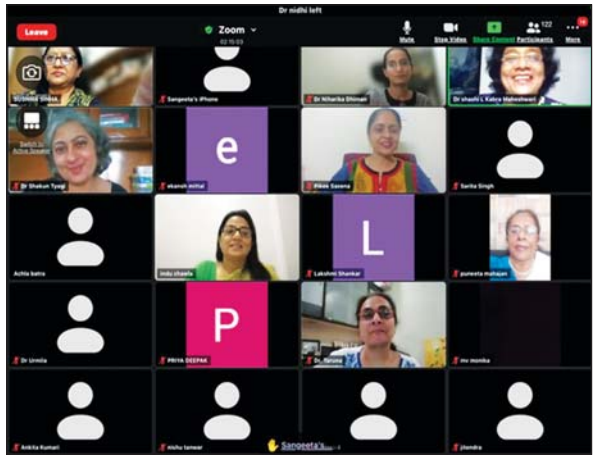
Quiz Answers

1:d	2:a	3:d	4:c	5:c	6:b	7:a	8:c
9:a	10:b	11:a	12:b	13:d	14:b	15:b	

NARCHI Activities

1. Webinar: Panel discussion on A to Z of GDM, June 19, 2021 a
   Under the aegis of NARCHI In association with multidisciplinary committee AOGF and DGFSW

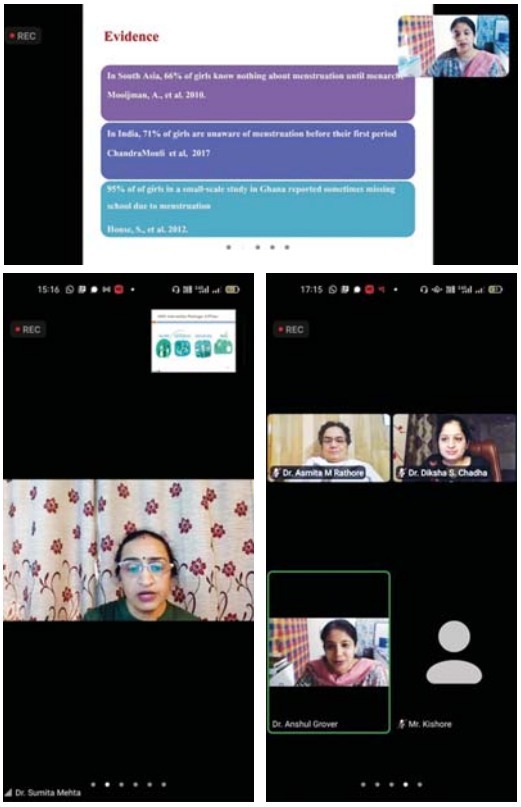




2. Webinar: Recurrent Pregnancy losses: Managing the Unexplained 24/06/21.
   Organied by FOGsd in association with NARCHI Delhi.

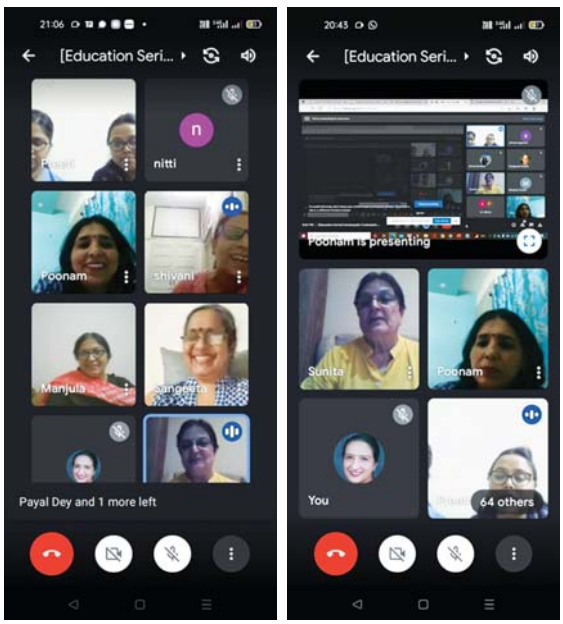
3. CME – Conversation on Mensturation, 26/6/21

   Deptt. of Obstetrics and Gynaecology, Babu Jagjeevan Ram Memorial Hospital, Delhi



4. Education series 5- 28/6/21, Kasturba Hospital and NARCHI, Delhi

   Postgraduate training -Intrahepatic cholestasis of pregnancy



5. World Population day and Population stabilization fortnight - NARCHI Delhi with its members and DFW, Govt of NCT Delhi.

6. Webinar: Hypertensive disorders in pregnancy, 30/6/21

   FOGsd under aegis of NARCHI Delhi , ISCCP,IFS,AICC RCOG NZ,

7. Webinar: PCOS & Infertility, 10/7/21
FOGsd in association with NARCHI Delhi.

8. Webinar: Pregnancies following ART, 3/8/21
AOGD infertility sub-committee in association with NARCHI

9. CME on Reining in the Caesarean Pandemic, 4th August, 2021
Department of Obstetrics & Gynaecology, Lady Hardinge Medical College With NARCHI, Delhi

10. FIGO Session - **Pregnancy and COVID-19** Maulana Azad Medical College, New Delhi and NARCHI, India

11. NARCHI annual conference 27th-29th August 2021.

12. NARCHI outreach activity: 29 sept 2021, Baba Saheb Ambedkar Medical College and hospital.

Health talks and performance of two" Nukkad Natak " on the theme of Antenatal and postnatal care, performed by residents of Dept of OBG in the OPD wing and PNC ward.

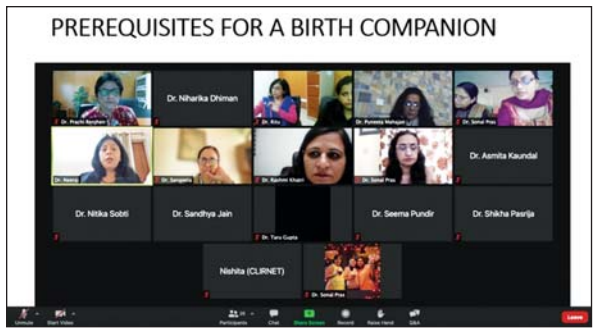
13. TOT on Family Planning Counselling Services organised by HFW Training Cell and Narchi Delhi, Dept of Obstetrics and gynecology, MAMC & LNH. 30th Nov & 1st Dec 2021

14. Male participation in Family Planning - NSV awareness fortnight 2/12/21

NSV awareness : Nukkad Natak

15. CME "Steps towards safe motherhood" - Birth Companion and VBAC, 11/12/21

Dr. Baba Saheb Ambedkar Medical College and hospital with NARCHI, Delhi



Annual Conference Glimpses

- **Pre-conference Workshops - 5**
- **Sheila Mehra QUIZ**
- **Oration by Sir Sabaratnam Arulkumaran**
- **Release of E- souvenir**

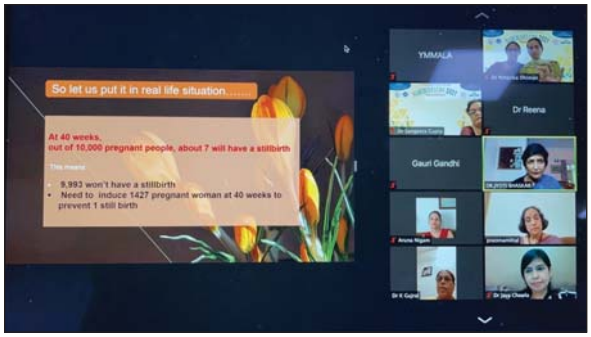
  - Workshops and Quiz

- **20 Scientific Sessions on Main Conference Day**
- **24 Prizes Won for Paper and Poster Presentation**
- **128 Paper Presented**
- **FIGo Complimentary Registration to Quiz Winners**

  - Main Conference

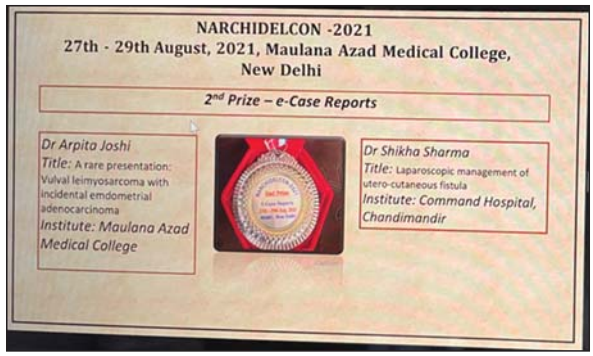
  - Release of E- souvenir

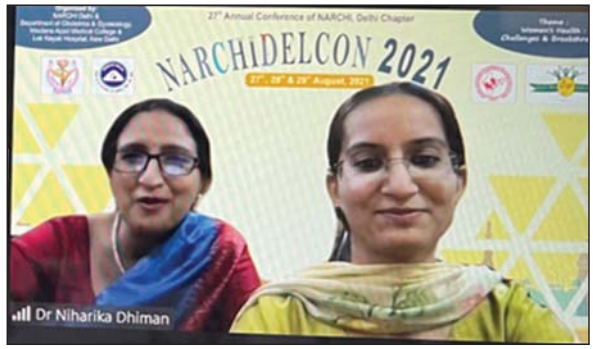
- Dr S Das Oration delivered by Sir S Arulkumaran



- Address by Narchi National President Dr K K Roy

- Validectory





The doctor of the future will give no medication but will interest his patients in the care of the human frame, in diet and in the cause and prevention of disease.

- Thomas Edison

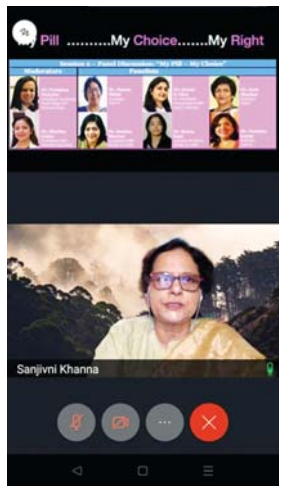
World Population Day

Activities Undertaken

- Mass Mail sent to ~1000 NARCHI Delhi Members
- Website: Message on homepage
- Advertisement in Bulletin - Full Page
- CME on Contraception
- College activity: Awareness and empowerment of the youth
- Awareness programmes including health talks, Nukadd Natak and Distribution of IEC material in various hospitals and polyclinics.

Webinar on Contraception

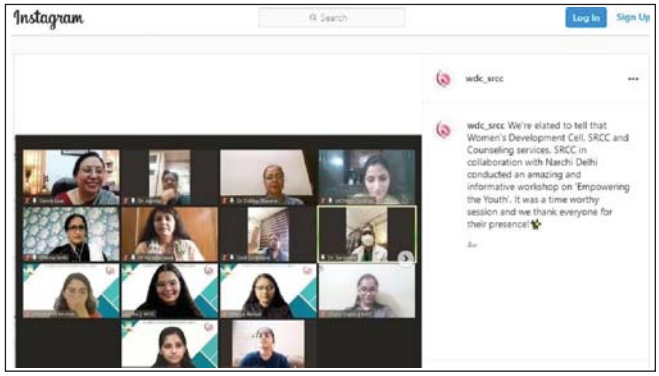
- DFW, Govt of NCT Delhi, in collaboration with Abbott, under the Aegis of NARCHI, DGF-North and AICC RCOG, NZ
- Lecture Topic: Choosing the Right Contraceptive Pill
- Panel Discussion: My Pill - My Choice
- Date: 29th June, 2021



College Activity: Awareness and Empowerment of the Youth

SRCC, New Delhi on 7th July 2021 3 pm onwards

Shared widely on Mass Media by instagram posts and whatsapp among the young



Awareness Programmes Incuding Health Talk, Distribution of IEC Material in Polyclinics

- Health talk on FP: 28th June 21
- At Polyclinic keshavpuram
- Attached with DCB Hospital
- Conducted by: Dr Salam Zeliang Nodal Officer and Incharge, family Planning, DCB Hospital
- Health talk at Delhi govt polyclinic at Ballimaran on 1st july
- Conducted by Dr Rashmi Yadav

Awareness Programmes in Various Hospitals

Activities conducted in Hindu Rao Hospital over 4 days as Nukkad Natak, Health Talks, Distribution of IEC Material

Kasturba Gandhi Hospital on 14th July, 2021

Lok Nayak Hospital Over 3 Days

पुरूषों ने परिवार नियोजन अपनाया
सुखी परिवार का आधार बनाया

बिना टांके, चीरे और जोश गँवाए
क्यों ना परिवार सुरक्षित बनाएं!

जोड़ी जिम्मेदार
जो प्लान करे परिवार

पुरुष नसबंदी (एन.एस.वी) पखवाड़ा

21 नवंबर से 04 दिसंबर 2021

संपर्क एवं जागरुकता सप्ताह
21 से 27 नवंबर

सेवा प्रावधान सप्ताह
28 नवंबर से 04 दिसंबर

- इस पखवाड़े के दौरान सभी सरकारी संस्थानों/अस्पतालों में पुरुष नसबंदी (एन.एस.वी) परामर्श व सेवाएं उपलब्ध कराई जाएंगी
- इच्छुक पुरुष इन विशेष सुविधाओं का लाभ उठाएं
- सुरक्षित, सरल, स्थायी गर्भनिरोधक तरीका जो न केवल न्यनतम अवधि में किया जा सकता है, बल्कि लाभार्थी अतिशीर्घ

पुरुष नसबंदी–एन.एस.वी करवाएं, अतिरिक्त सुविधाएं लाभ में पाएं

- **1100 रू. की प्रोत्साहन राशि** (लाभ राशि पाने के लिए आधार कार्ड तथा उससे जुड़े बैंक खाते की जनकारी उपलब्ध कराएं)
- **सरकारी कर्मचारी को छुट्टी का प्रावधान**

विस्तृत जानकारी के लिए अपने निकटतम स्वास्थ्य केन्द्र की आशा/ए.एन.एम दीदी से संपर्क करें या 9643483453 पर एस.एम.एस या वॉट्सप करें

DIRECTORATE OF FAMILY WELFARE GOVT. OF DELHI

परिवार कल्याण निदेशालय, दिल्ली सरकार

ई-मेल: dirdfw@nic.in,spofpdfw3@gmail.com

जिम्मेदारी निभाओ
प्लान बनाओ

Men adopting family planning lay the foundation of a happy family

NATIONAL HEALTH MISSION

Vasectomy Fortnight 2021 - 21 November to 04 December

Mobilization Phase	Service Delivery Phase
21-27 Nov.	28 Nov. - 04 Dec.

Call For Action

NARCHI SUPPORTS MALE PARTICIPATION IN FAMILY PLANNING

This entire fortnight, let us Encourage
"ELIGIBLE COUPLES WITH LIMITING NEED OF CONTRACEPTION"
to **prefer NSV over Female Sterilization**

IMPLE	-Two instruments only
TITCHLESS	- Minimally invasive
CALPELLESS	-No incision
AFE	-Negligible complications
OUND	-Negligible failure

- All Public Hospitals will provide NSV services throughout the Fortnight
- Cases Performed in Private may be intimated to respective CDMOs.

Directorate of Family Welfare, GNCTD
e-mail : dirdfw@nic.in, spofpdfw3@gmail.com

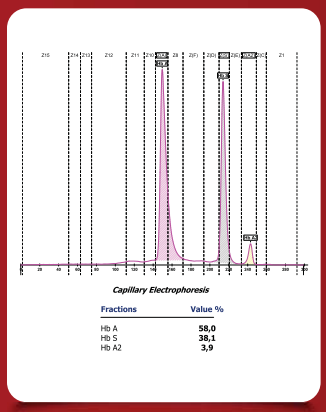
An ounce of prevention is worth a pound of cure.

- Henry de Bracton

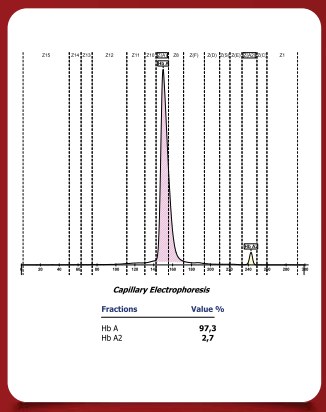
HIGH RESOLUTION AND CLEAR-CUT SEPARATION OF

HEMOGLOBIN FRACTIONS

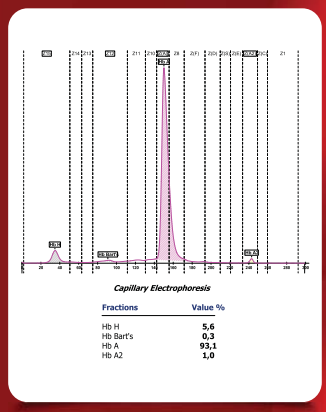
BY CAPILLARY ELECTROPHORESIS



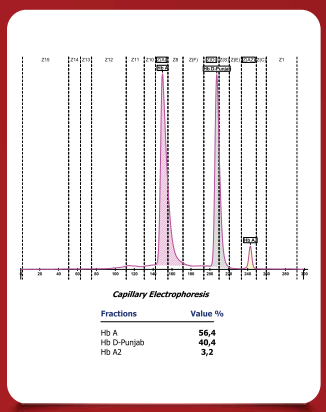
HB S



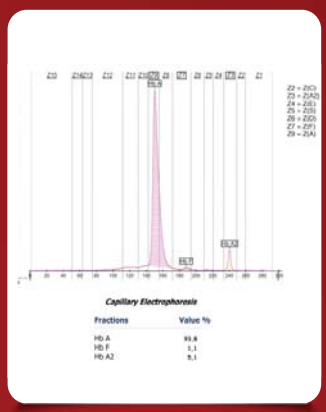
NORMAL SEPARATION



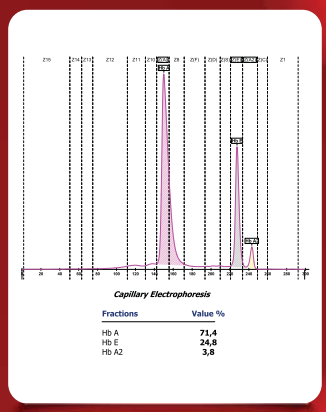
HB H



HB D-PUNJAB



BETA-THALASSEMIA



HB E

sebia

The new language of life

SEBIA DIAGNOSTIC INDIA PVT. LTD.
901, 9th Floor, Tower B, Emaar Digital Greens,
Golf Course Ext. Road, Gurgaon-Haryana-121011
Tel.: +91 124 4262100 | **Email:** sebiaindia@sebia.com

www.sebia.com