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CASE REPORT

Maternal Anti-Ro/SSA and Anti-La/SSB Antibodies and Fetal Congenital Heart Block

Kapur Anupam · Dey Madhusudan · Tangri Manoj · Bandhu H. C.

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About the Author

Dr Anupam Kapur is a Professor in Obstetrics and Gynecology at Armed Forces Medical College, Pune. He is a trained endoscopic surgeon with keen interest in Fetal medicine and management of high risk pregnancy. He is teaching undergraduate and post graduate students for last 20 years in armed forces. He had completed 12 research projects and published research papers in various journals. He is regularly delivering lectures in various conferences and he was resource person for various workshops and symposium. He is presently working on various risk factors associated with late preterm birth and also the role of mifepristone in conservative management of fibroids

Introduction

The incidence of CHB is 2 % in cases of maternal anti-Ro/SSA antibody positivity, 3 % when both anti Ro/SSA and anti-La-SSB are positive. The risk of recurrence is 9 times higher in the subsequent pregnancies [1]. Underlying structural congenital heart disease is associated with more than half of the fetuses found to have CHB and it is then defined "isolated" in the absence of structural heart disease. It is important to distinguish these two forms of CHB because they differ not only in their pathogenesis and in their rate of recurrence, but also in the prognoses of children affected. Infants with CHB associated with severe structural heart disease have a poorer prognosis than infants with isolated CHB [2].

Kapur A., Professor · Dey M. (✉), Reader
Department of Obstetrics and Gynecology, Armed Forces Medical College, Pune 411040, India
e-mail: deym0309@gmail.com

Tangri M., Classified Specialist · Bandhu H. C., Professor & HOD
Department of Obstetrics and Gynecology, Command Hospital, Pune 411040, India

Case No 1

A 27-year-old G2P1L1 lady at 19 weeks POG reported to antenatal OPD with h/o fetal congenital heart block in her previous pregnancy which was diagnosed at 34 weeks POG. Post delivery at 3 months, pacemaker was placed in the infant and till date the baby is doing fine with it. The lady was evaluated and found to have ANA & ACLA-IgM positive status with strongly positive SS-A (Ro) antibodies. Her SS-B (La) antibodies were negative. She was started on ecosprin, hydroxy chloroquine, and unfractionated heparin. ASD was detected at fetal echocardiography, but the rest of the anomaly scan was within normal limits. At

36w3d POG, she reported to labor room with complaints of decreased fetal movements. On evaluation, biophysical profile was 10/10 but she had spontaneous premature rupture of membrane on the following day. After 03 h she went into spontaneous labor and on NST fetus had variable deceleration for which she underwent emergency LSCS and delivered a male baby weighing 2.6 kg with APGAR score at 1 and 5 min of 4 and 6, respectively. Baby was shifted to NICU and was on ventilator support for 7 days and discharged after 15 days.

Case No 2

A 23-year-old G2P1L1 lady reported to our antenatal OPD at 24-week period of gestation (POG). In her last pregnancy, she underwent emergency caesarean section at term for breech presentation and delivered a healthy male baby weighing 2.7 kg. She also gives history of preeclampsia that developed at 36-week period of gestation for which she was monitored by daily blood pressure and biochemical & haematological parameters. She had no other significant past medical history.

On examination, uterine height corresponded with POG and fetal heart sound was 60 per min on doppler (Fig. 1). Her antenatal biochemical and haematological parameters were within normal limits. Immunological tests revealed serum ANA moderately positive and SS-A (Ro) antibodies and SS-B (La) antibodies strongly positive. Ultrasound examination revealed a single live intra uterine fetus at 24w2d POG with FHR of 56–60/min. Fetal echocardiography showed complete heart block with structurally normal heart. Maternal echocardiography was within normal limits. She was started on dexamethasone (4 mg/day), iron, and calcium supplements. She was followed up by weekly ultrasound to follow the FHR pattern and FHR was stable at 52–56 beats/min with no features of hydrops.

At 35w3d POG, she underwent caesarean section for preterm labor with post caesarean status and delivered a female baby weighing 2.1 kg. The heart rate at birth was 60 beats/min and APGAR score at 1 and 5 min was 7 and 9, respectively. Post delivery in the NICU, baby was stable at room air with heart rate of 60 beats/min. ECG shows heart beat of 54/min and echocardiography did not reveal any structural abnormality. Baby was discharged after 1 week and is on follow-up every week, till date post 3 month baby has not required a pacemaker.

Case No 3

A 24-year-old G5P1L1A3 lady was booked with us at 12 weeks POG with three previous first trimester abortion.

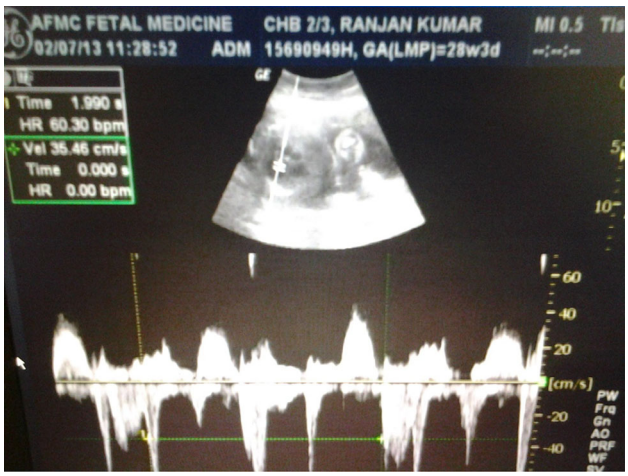

Fig. 1 Doppler showing fetal heart rate of 60 beats/min

In her last pregnancy 3 years ago, she was diagnosed to be a case of SLE with positive ANA, SS-A (Ro) antibodies, and SS-B (La) antibodies after detection of fetal congenital heart block at 24 weeks POG. The pregnancy had ended in a Caesarean Section done for Cephalopelvic Disproportion. The infant required permanent pacemaker at day 10 of life. She was already on Tab Prednisolone and Hydroxy Chloroquine which was continued throughout the present pregnancy. The fetal heart rate in the present pregnancy remained normal throughout. All other investigations including anomaly scan & fetal echocardiography were within normal limits. She underwent emergency LSCS at 38w4d POG for premature rupture of membrane with unfavorable cervix and delivered a male baby weighing 2.75 kg with APGAR score at 1 and 5 min was 7 and 9, respectively. Baby and mother were discharged on 4th post natal day.

Discussion

Isolated CHB or CHB with a structurally normal heart is frequently associated with maternal autoantibodies to Ro/SSA and La/SSB. In this series of cases, all the mothers were positive for ANA, SS-A (Ro), antibodies and SS-B (La) antibodies except in first case where SS-B (La) antibodies were negative. Pregnant women whose sera contain anti-Sjögren's syndrome A (SSA)/Ro antibodies (in the presence or absence of anti-SSB/La antibodies) have a 1–7.5 % risk of having a child with third-degree CHB [3]. The CHB presents as fetal bradycardia and cardiac failure, i.e., pericardial effusion and hydrops, after 16–24 weeks of gestation. A life-threatening cardiomyopathy [4] may be present in 10–15 % cases. Risk factors for death in these patients are very low heart rate, low birth weight,

premature gestation, hydrops fetalis, endocardial fibroelastosis, and diminished ventricular function. Patients who are diagnosed and treated in the neonatal period have a survival rate of 94 % [5].

The best screening test for SLE is identification of ANA. Anti-ds DNA is highly specific for SLE. Mothers with autoimmune antibodies should undergo regular fetal ultrasonographic assessments including fetal echocardiography as early as 16 weeks of gestation which can reveal varying degrees of AV block and further fetal monitoring should be performed to look for bradycardia, fetal distress, and hydrops fetalis [5]. In all of our cases, ANA, SS-A (Ro) antibodies, and SS-B (La) antibodies were detected after the diagnosis of fetal congenital heart block on ultrasonography. The frequency of CHB in a primigravida with positive antibodies is 1–7.5 %; however, the recurrence rate in subsequent pregnancies is about 2–3 times higher, i.e., around 20 % [6]. Risk factors for recurrence other than a previous child affected with CHB are positive anti-SSA/Ro and/or anti-SSB/La antibodies [6], and the presence of human leukocyte antigen-DR3 in the mother [7].

It has been suggested that cases of complete in utero AV block are often anti-Ro/La-positive, while incomplete blocks are generally negative [8]. All 3 cases had complete fetal congenital heart block with anti-Ro/La—positive status. Regular and close monitoring for heart block and transplacental therapy with fluorinated steroids (dexamethasone) have shown satisfactory results at first evidence of heart block, and it is beneficial in first and second degree heart block but once fetal third-degree block is detected, it is irreversible regardless of treatment [1]. Prophylactic therapy is not currently indicated as they may have maternal and fetal side effects [9]. We also followed the same protocol in our second case along with fetal echocardiography which showed a structurally normal heart. Although maternal tolerability of dexamethasone in our patient was excellent, dexamethasone used throughout the pregnancy may be associated with infection, osteoporosis, osteonecrosis, diabetes, hypertension, premature rupture of membranes, preterm labor and preeclampsia with infection in the fetus, adrenal insufficiency of the fetus, intrauterine growth restriction (IUGR), and oligohydramnios [10]. Intravenous gamma globulin (IVIG) has been of benefit in a variety of immune-mediated and inflammatory diseases, but treatment with intravenous immunoglobulin (PITCH study) showed that it is ineffective as a prevention of CHB in pregnancies at risk of recurrence [11]. For treatment of CHB, early pacemaker insertion may be required in some newborns and permanent pacemaker placement is eventually needed in most children with congenital heart block.

In conclusion, most of the fetal congenital heart block is associated with maternal ANA, SS-A (Ro), and SS-B (La) antibodies. They are at high risk of having fetal CHB and frequent surveillance at 16–20 weeks of gestation is required as early treatment in first & second degree heart block by steroids may improve the outcome of the fetus. The delivery should be planned in a tertiary care centre where pacemaker placement facility is available.

Compliance with ethical requirements and Conflict of interest Kapur Anupam, Dey Madhusudan, Tangri Manoj, Bandhu HC declare that they have no conflict of interest. Additional informed consent was obtained from all patients for whom identifying information is included in this article.

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