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Epidural anaesthesia during labour for a patient with congenital complete heart block: a case report

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Epidural anaesthesia during labour for a patient with congenital complete heart block: A Case Report

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Abstract

We report labour pain management in a full term pregnant patient with Congenital Complete Heart Block. She delivered uneventfully under routine monitoring with facilities for pacing at hand. She previously had an uneventful normal delivery and a D&E, both outside our hospital. Only findings were a low heart rate of 45-50 beats per minute. She never had syncopal attacks. She had a good effort tolerance on ETT. Her ejection fraction was 60% on Echocardiogram. She was given a single shot low dose spinal with fentanyl followed by epidural insertion. She successfully delivered through mid-cavity forceps in about 2.5 hours. The only problem encountered was a transient bradycardia of 40 per minute with a systolic blood pressure of 70 mmHg, which settled with ephedrine.

Pace maker insertion is recommended early in case the patient is symptomatic or has a prolonged Q-T interval or left atrial enlargement on ECG. Regional anaesthesia is recommended to prevent valsalva induced bradycardia or cardiac arrest during expulsive efforts by the patient.

Introduction

Congenital complete heart block is a rare congenital abnormality in which there is block at the AV node. Its incidence is reported to be 1:20,000[1] live births. Patients may experience syncope and dyspnoea due to incomplete ventricular filling. In 53% of patients it may be associated with other cardiac lesions.[2] It has a strong correlation with positive autoimmune antibodies.[3] It tends to worsen over time but rarely may resolve spontaneously. Steroids have also been reported to be effective.[4] Pregnancy is usually well tolerated with this disorder unless there are symptoms of syncope and dysponea. Pace maker insertion is recommended early in case the patient is symptomatic or has a prolonged Q-T interval or left arterial enlargement on ECG. Regional anaesthesia is recommended to prevent valsalva induced bradycardia or cardiac arrest during expulsive efforts by the patient.

Case

A 29 years old Gravida 2 Para 3, presented with 40 weeks gestation for delivery. She was known to have congenital complete heart block (CCHB). She had no history of attacks of syncopy or dizziness. Only transient attacks of shortness of breath were reported, which settled without any treatment. She never had a pacemaker and had a good effort tolerance on ETT. Echocardiogram was within normal limits with an ejection fraction of more than 60%. Her labs were within normal limits. Her base line heart rate was 45-50 beats per minute and a blood pressure of 100/60 mmHg. She had one delivery and one D&E in the past which were both uneventful.

Monitoring was done with ECG, NIBP and SpO_2. Atropine, Swan sheath, Pacemaker and Transcutaneous pacing equipment were all at hand. As she was greately distressed with pain a single shot spinal with 2.5mg bupivacain and 25µg fentanyl was given in sitting position with a 25G sprotte needle followed by epidural catheter insertion with a 16G Tuohe needle. The patient had a transient bradycardia of 35 beats per minute with the systolic blood pressure decreasing to 70 mmHg. This was successfully treated with two boluses of 2.5 mg ephedrine and I/V fluids. A single 10 ml bolus of 0.1% bupivacaine was given after an hour. Infusion was not required as a healthy baby girl was delivered uneventfuly with the help of mid cavitary forceps.

Discussion

Women with complete heart block cannot augment their cardiac out put due to limitation in their heart rate response, but generally they tolerate pregnancy well, unless

there is significant heart disease.[5] Valsalva maneuver in the second stage may be complicated with syncope and convulsions due to further slowing of the heart rate. In order to minimize the bearing down effect it is advisable to deliver the patient in the lateral decubitus position with the help of forceps.[6] Causes of bradycardia other than CCHB, such as hyperkalaemia, hypothyroidism, use of ß-blockers, calcium channel blockers and digitalis should be ruled out.

In complete heart block the P waves are not conducted to the ventricles because of block at the AV node. The ventricles are depolarised by a ventricular escape rhythm. In ECG the P wave and the QRS complex beat separately at their own intrinsic rhythm. The atria contract at a rate of 60 to 80 beats per minute and the ventricles at a rate of 40 beats per minute. This may lead to inadequate ventricular filling with consequent low cardiac output and at times precipitate syncope and convulsions. On auscultation there is variable first heart sound and the carotid pulse reveals cannon waves.

Congenital complete atrioventricular block

Congenital complete atrioventricular block (CCAVB) is a rare disease with an incidence of one in 20'000 live born infants.[1] The aetiology is not completely understood. Congenital heart block with structural heart disease is thought to be caused by failure of the AV conduction system to connect. CCAVB may be combined with congenital heart diseases in up to 53% of individuals or be isolated as in our patient. Of these patients, 98% are associated with positive autoimmune antibodies in the maternal serum (anti-Ro/SS-A and anti-LA/SS-B). Morbidity and mortality of CCAVB do not seem to correlate with antibody status or associated cardiac lesions. The onset of clinical symptoms in patients with CCAVB may occur antenatally in up to 28%, but can also occur only later in life. There are case reports, that foetal CCAVB can be improved with steroids.[4] Rarely, CCAVB resolves spontaneously. In most patients, the degree of conduction abnormality will either persist or worsen over time.

CCAVB and Pregnancy

If congenital heart block is recognized during pregnancy cardiology evaluation is warranted to determine whether placement of a pacemaker (either temporary or permanent) is indicated or not. In general a pacemaker is indicated if the patient is symptomatic or has a prolonged Q-T interval (Normal QT Interval $\leq$ 0.40 sec) or has evidence of left atrial enlargement. Patients with symptomatic bradyarrhythmias had successful pregnancies and deliveries. First case of complete heart block in pregnancy was reported in 1914 by Nanta as mentioned by Jaffe[7] and the first pacemaker before pregnancy was by Shouse and Acker.[8] Initially fixed rate pacemakers were used but later rate adjustable pacemakers were introduced.

Temporary pacing is indicated in a patient near term as syncope and convulsions due to slowing of the heart rate can occur during valsava maneuver in the second stage of labour. It is advisable to deliver in the lateral decubitus position and to shorten the second stage by using forceps.

Pacemaker in a pregnant patient can be inserted under ECG or echocariographic guidance to avoid foetal exposure to ionization radiation.[9]

Permanent pacing is the therapy of choice in the first and the second trimester in a symptomatic patient. These have been successfully implanted under fluoroscopic guidance with the help of a guard.

Avasthi[10] reports of successful delivery of triplets in a patient with CCHB through caesarean section under general anaesthesia. She had a heart rate of 52/min. her echo revealed an ejection fraction of 68% and she never had any symptoms of syncope or dyspnoea.

Conclusion

Epidural anaesthesia during labour is recommended to minimize maternal expulsion efforts- (which might cause further slowing of the heart rate), and to facilitate a painless instrumental vaginal delivery. Patients without signs and symptoms and no ECG evidence of prolonged Q-T and left atrial enlargement, should have the facilities for temporary pacing at hand. Others should have a pacemaker inserted early.

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