

## Fetal tachycardia as neonatal atrial flutter- A case report

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### ABSTRACT

Fetal atrial flutter is diagnosed as atrial rate of 300-600/min, with or without 1:1 conduction to the ventricle. It can present with or without non immune hydrops in fetus. This can be diagnosed as fetal tachycardia clinically or ultrasonographic studies. Antiarrhythmic drug therapy is indicated in both type of atrial flutter, which can be given as either maternal route or transperitoneal or directly through umbilical vein. Fetus can undergo vaginal delivery. Refractory cases are usually associated with structural heart disease. Which includes endocardial fibroelastosis, cardiomyopathy and congenital heart disease including hypoplastic LV, right ventricular outflow tract obstruction, ebsteins anomaly, atrioventricular septal defect. Treatment beyond neonatal period is seldom required.

**Key words :** fetal tachycardia, neonatal atrial flutter, fetal tachyarrhythmia

### INTRODUCTION

Fetal tachyarrhythmia includes supraventricular tachycardia, atrial flutter, atrial fibrillation and very rarely ventricular tachyarrhythmia.<sup>1,2</sup> Fetal atrial flutter is defined as atrial rate 300-600/min, with or without 1:1 conduction to the ventricle. Atrial flutter starts after 30wks of gestation because fetal atrium reaches critical size by 27-30 wks of gestation.<sup>3</sup> It is diagnosed clinically by fetal tachycardia or during USG study as well as by fetal echocardiography.<sup>4</sup> Drug therapy is indicated for both atrial flutter with/ without non-immune hydrops.<sup>4</sup> Drugs used are digoxin, verapamil, amiodarone and propafenone in doses higher than the usual.<sup>6</sup>

DC cardioversion of atrial flutter is also successful in terminating in neonatal atrial flutter although the effect may be transient with chances of relapse.<sup>7</sup> Energies of 1-2J/kg are usually sufficient to convert the flutter to sinus rhythm. Alternatively, trans-esophageal pacing can be used with varying success to overdrive atrial flutter. Delivery should be attempted in fetus with intractable flutter because it is easier to achieve control of the rhythm ex-utero with pharmacological or non-pharmacological means.<sup>8</sup> Prophylaxis beyond neonatal period is not necessary and may not require chronic antiarrhythmic therapy.<sup>9</sup>

### CASE REPORT

During the routine antenatal checkup of 27 year old primi of non-consanguineous marriage, the treating obstetrician on auscultation noticed fetal tachycardia at 30wks of gestation. However, the doctor neither advised further investigation nor told the pregnant lady anything about it. As she was asymptomatic, she didn't have any further check up. At 37 weeks, due to decrease in fetal movement she consulted the same obstetrician. This time also fetal tachycardia was present. She was advised ultrasonography examination which showed fetal tachycardia (216-220/min and regular). There was no hydrops fetalis. Baby was delivered by elective caesarian section immediately in a private nursing home. Birth weight was 3.6 kg. The baby was otherwise normal and no features of haemodynamic decompensation were present. Due to persistent tachycardia, the neonatologist tried possible vagal maneuver, but it could not be corrected. The baby was admitted into neonatal intensive care unit.

A 12 lead ECG revealed supraventricular tachycardia. The baby was administered 3 repeated doses of adenosine, but without any success. ECHO did not reveal any abnormality. Loading dose of intravenous digoxin was given, followed by maintenance dose of esmolol infusion. There was no change in the heart rate till 4<sup>th</sup> day. Further analysis of ECG revealed atrial flutter with 2:1 conduction to the ventricle. Digoxin and

esmolol were stopped. Bolus dose of amiodarone infusion for 24 hours was started followed by maintenance dose, which also failed to correct heart rate necessitating electrical cardioversion. Synchronous DC shock of 1j-3j/kg was given. Atrial flutter with varying block became obvious but not reverted to sinus rhythm. The baby remained otherwise normal during the course of treatment. Baby was kept for another one week under observation; heart rate was gradually coming down but sinus rhythm could not be achieved. Baby was discharged with atrial flutter with ventricular rate of 150-160/min. After one month of follow up, ECG and ECHO findings reverted back to normal allowing the child a normal life. Amiodarone was continued for another three months.

### CONCLUSION

Atrial flutter, although rare, can be fatal. There are

varying therapeutic approaches in different centers and the subject is somewhat controversial. In the fetal period, a variety of anti-arrhythmics are available; they are mainly indicated for fetuses of less than 32 weeks and with signs of heart failure. In the neonatal period, pharmacological therapy and electrical cardioversion can be effective, as seen in this case.

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### REFERENCES

1. Peng CC, Chen MR, Hou CJ, Hung HY, Kao HA, Hsu CH, Huang FY. Atrial flutter in the neonate and early infancy. *Jpn Heart J.* 1998 May;39(3):287-95.
2. Wu TH, Huang LC, Ho M, Lee CC, Chiu TH, Hung YC. Fetal atrial flutter: a case report and experience of sotalol treatment. *Taiwan J Obstet Gynecol.* 2006 Mar;45(1):79-82.
3. Lisowski LA, Verheijen PM, Benatar AA, et al. Atrial flutter in the perinatal age group: diagnosis, management and outcome. *J Am Coll Cardiol.* 2000 Mar 1;35(3):771-7.
4. Gembruch U, Redel DA, Bald R, Hansmann M. Longitudinal study in 18 cases of fetal supraventricular tachycardia: Doppler echocardiographic findings and pathophysiologic implications. *Am Heart J.* 1993 May;125:1290-301.
5. Naheed ZJ, Strasburger JF, Deal BJ, Benson DW Jr, Gidding SS. Fetal tachycardia: mechanisms and predictors of hydrops fetalis. *J Am Coll Cardiol.* 1996 Jun;27(7):1736-40.
6. Gembruch U, Manz M, Bald R, et al. Repeated intravascular treatment with amiodarone in a fetus with refractory supraventricular tachycardia and hydrops fetalis. *Am Heart J.* 1989 Dec;118(6):1335-8.
7. Till J, Wren C. Atrial flutter in the fetus and young infant: an association with accessory connections. *Br Heart J.* 1992 Jan;67(1):80-3.
8. Hansmann M, Gembruch U, Bald R, Manz M, Redel DA. Fetal tachyarrhythmias: transplacental and direct treatment of the fetus-a report of 60 cases. *Ultrasound Obstet Gynecol.* 1991 May 1;1(3):162-8.
9. Texter KM, Kertesz NJ, Friedman RA, Fenrich AL. Atrial flutter in infants. *J Am Coll Cardiol.* 2006 Sep 5;48(5):1040-6.