FETAL HYDROCEPHALUS EARLY ULTRASOUND DIAGNOSIS

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SUMMARY

Hydrocephalus is one of the common congenital malformation of the central nervous system. The recurrence risk for next sib varies from 3 to 5% to 25% depending on type of hydrocephalus. Real time ultrasonography in high-risk pregnant women for hydrocephalus helps in counselling of these patients. In the present study real time ultrasonography was done in 80 high-risk pregnant women for hydrocephalus and hydrocephalus was diagnosed in 7 cases before 28 weeks gestation. In 5 cases it was isolated hydrocephalus and in 2 cases there was associated meningomyelocele.

Introduction

Fetal hydrocephalus is defined as an abnormal and excessive accumulation of cerebrospinal fluid (CSF) within the ventricular system of developing brain. This fetal disease occurs at the frequency of approximately 1 in 500 live births. Progressive ventriculomegaly is the hall mark of this disorder. The prognosis varies widely with the etiology and the extent and duration of obstruction (Manning *et al* 1984).

Fetal hydrocephalus may be diagnosed sonographically in the mid-trimester by measurement of lateral ventricles, width and the hemispheric width. The fetal biparietal diameter (BPD) may be normal at this stage of pregnancy in the presence of significant ventricular dilatation and is thus the latter is the most reliable indicator of fetal hydrocephalus (Hobbins *et al* 1979).

Recently, antenatal treatment of hydrocephalus has been tried by in utero ventriculo-amniotic shunts (Clewell *et al* 1981; Bithols 1981). The long term benefits of fetal ventricular shunting are unknown and it needs long term follow up of treated infants.

In the present paper we report fetal hydrocephalus diagnosed before 28 weeks of gestation by real time scanning in 7 high-risk pregnant women.

Material and Methods

Fifty pregnant women with previous history of hydrocephalus and 30 other high-risk pregnant women were scanned with real time ultrasonography (Technicare Model No. SSD210) using 3.5 MHz transducer.

The diagnosis of hydrocephalus was made by visualizing dilated lateral ventricles and increase in the ratio of ventricular and hemispheric width (Figs. 1 and 2). The fetal spine was examined in longitudinal and transverse scans for any spinal anomalies.

The clinical, ultrasonographic and follow up finding were shown in Table 1. Out

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TABLE I

Case No.	Indication of Scan	Gestational Age	Scan Findings	Follow up
1. M 28 years	Previous 2 children had hydrocephalus	28 weeks gestation	BPD 8.4 cm Both lateral ventricles dilated spine normal	Delivered Male fetus Hydrocephalue present
2. P.S. 30 years	Previous 2 children had hydrocephalus	22 weeks gestation	BPD 6 cm lateral ventricles dilated spine normal	Pregnancy was terminated and female fetus with hydrocephalus
3. P 23 years	First—Vesicular mole	26 weeks gestation	BPD 7.2 cms Both lateral ventricles dilated spinal deformity present	fetus hydrocephalus with meningomyelocele delivered gomyelocele delivered
4. V 25 years	Previous 2 children had hydrocephalus	24 weeks gestation	BPD 8 cm Both lateral ventricles dilated spinal deformity present	Pregnancy terminated delivered female fetal hydrocephalus with meningomyelocele
5. L.A. 19 years	History of hydrocephalus in previous child	18 weeks gestation	BPD 5 cm Both lateral ventricles dilated, spine normal	Pregnancy terminated. Female fetus with hydrocephalus
6. S.L. 26 years	History of congenital anomaly	20 weeks gestation	BPD 6.2 cm. Both lateral ventricles dilated spine normal	Pregnancy terminated. Female fetus with hydrocephalus
7. M 22 years	History of congenital anomaly	28 weeks gestation	BPD 8.1 cm. Both lateral ventricles dilated spine normal	Pregnancy terminated. Female fetus with hydrocephalus

of 7 cases, 5 had isolated hydrocephalus and in 2 cases there was menigomyelocele in addition to hydrocephalus. The anomaly was diagnosed in 5 cases before 24 weeks of gestation and in 2 cases before 28 weeks of gestation.

Discussion

Serial ultrasound measurement of ventricular size and evaluation of intracranial architecture form the primary basis for detection of fetal hydrocephalus. By ultrasound scanning in second trimester patients who have already been delivered an infant with inherited defects can often be offered diagnostic information early enough to allow them an option of terminating the pregnancy. In the third trimester if fetal anomaly is diagnosed, ultrasonically derived information may be critical to the patient's obstetric management and to the immediate care of new born.

Hobbins *et al* in 1979 reported prenatal diagnosis of hydrocephalus in 11 cases of which in 3 cases the diagnosis was made in second trimester. Campbell and Pearce (1983) have reported hydrocephalus in 16 cases diagnosed before 26 weeks of gestation.

Manning *et al* in 1984 reported that rate of progression of ventriculomegaly depends on the type of obstructive hydrocephalus.

In Arnold Chiarie malformation the rate of progression of ventriculomegaly is widely variable and less severe, whereas in aquductal stenosis defect occurs early in pregnancy (< 12 weeks) and is associated with varying degree of ventriculomegaly.

Serial ultrasound measurement of ventricle size and evaluation of intracranial architecture is very useful for detection of fetal hydrocephalus in high risk pregnant women.

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