

(RESULTS) 1. UPBF correlated well with uterine cervical blood flow, which is also well correlated with MCO. 2. In 12 MCO decreased from the supine to the lateral position, 7 showed increased FUPR and 3 showed no change. In 10 MCO decreased, 6 showed decreased FUPR and 3 showed no change. 3. Cord blood hematocrit showed a negative correlation ( $-0.32$ ,  $p < 0.05$ ) with FUPR and showed a positive correlation ( $0.37$ ,  $p < 0.05$ ) with urinary ADH. 4. FUPR has a negative correlation with AF-Na ( $-0.22$ ,  $p < 0.05$ ) and AF-ADH ( $-0.26$ ,  $p < 0.05$ ).

(CONCLUSIONS) The mechanisms of oligoamnios associated with placental insufficiency are as follows: 1. Increased fetal hematocrit, as a result of decreased UPBF, causes FUPR decrease, resulting in decreased AF volume. 2. Increased AF-Na, and ADH as a result of decreased fetal urine flow causes water outflow from the amniotic cavity.

#### 174. Effect of the Placental Blood Flow in the Thermoregulation on Fetal Lamb in Utero

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This is a study on the effect of the placental blood flow on fetal thermoregulation in utero. Fetal and amniotic fluid temperature responses were measured in 9 unanesthetized, chronically prepared ewe (134~148 days) before and after intrauterine ventilation with oxygen, after snaring of the umbilical cord to prevent placental heat exchange, and following fetal death.

**Results:** 1) During the control phase, fetal temperature averaged  $39.61 \pm 0.04^\circ\text{C}$  and fetal-maternal temperature gradient was  $0.44 \pm 0.02^\circ\text{C}$ . 2) Fetal temperature rose only an additional  $0.9^\circ\text{C}$  following snaring of the cord. And fetal-maternal temperature gradient widened  $1.67 \pm 0.04^\circ\text{C}$ . 3) Amniotic fluid temperature came to lie midway between fetal and maternal temperature as fetal temperature rose, and remained elevated after fetal death.

**Conclusion:** After snaring of the umbilical cord, fetal temperature rose immediately as heat produced by the fetus could not exit to the mother through the placenta. We assumed the change of fetal temperature is an important index on fetal distress induced by the disturbance of the placental circulation.

#### 175. Assessment of Fetal Circulatory Disorder

#### with Blood Flow Wave Form in Fetal Inferior Vena Cava

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The blood flow in fetal inferior vena cava was studied with pulsed Doppler ultrasound. Under the normal sinus rhythm, the fetal IVC blood flow shows a pulsatile pattern synchronized with cardiac cycle. In this study, we calculated the Reverse Index (RVI). This index was defined as the ratio of the flow velocity of a flow Sf to the flow velocity of a flow A. A Flow Sf is a blood flow entering the right atrium and coincides with atrial relaxation and ventricular systole. A flow A is a blood flow retrograding from the right atrium and occurs at atrial contraction. Examinations were done on 52 fetuses from 24 gestational weeks to 39 gestational weeks excluding fetuses in arrhythmias. The RVI had no correlation with gestational weeks. RVIs were below 0.4 in fetuses with no circulatory problems. In 12 fetuses their RVIs were above 0.4. They were fetal distress, hydrops fetalis, sinus bradycardia, some of cardiac anomalies and tricuspid valve regurgitation. In these cases, the central venous pressure was supposed to be elevated, so the Reverse Index of fetal inferior vena cava may be a good criterion to evaluate the volume overload to the fetal heart.

#### 176. Intrauterine Treatment of Nonimmunologic Hydrops Fetalis

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In order to assess the effect of intrauterine treatment for nonimmunologic hydrops fetalis (NIHF), the present study was performed.

Thirteen cases with NIHF were treated in utero. Of these cases, three due to cardiac failure, including a decreased fractional shortening of bilateral ventricles without organic heart disease, a Ebstein's anomaly and a DORV, were treated with transcatheter digitalization. Four cases associated with miscellaneous disorders, including a meconium peritonitis, a chyloascites and two trisomy 21, were

treated with albumin injection into fetal abdominal cavity. Six cases due to unknown causes were treated with albumin injection or blood transfusion or both.

Of three cases due to cardiac failure, the signs of NIHF disappeared in utero in two cases, but only one survived and two with organic heart diseases died during neonatal period. Among four cases associated with miscellaneous disorders, the signs of NIHF disappeared in utero in one. Two cases survived and two trisomy 21 died during neonatal period. Of six cases due to unknown causes, the signs of NIHF disappeared in utero in one and two cases survived.

The results suggest that the intrauterine treatment in line with our protocol is effective.

### 177. Measurement of Fetal Liver in Utero Using Ultrasound

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As the growth of the liver is stunted in the presence of intrauterine growth retardation, the ultrasonically determined growth of the fetal liver size may contribute to an early recognition. However, the method of scanning the fetal liver has been not described completely. We direct attention to the relationship between liver size and various growth parameters or gestational age.

The fetal liver size was defined as right hepatic lobe length, area or circumference, liver area or circumference, and left hepatic lobe length. The liver size increased linearly with advance in the gestation. The right hepatic lobe grew in the different fashion from the left hepatic one. The liver size highly correlated with the growth parameters of BPD, FFL and FAC, and gestational age. Also, in the fetus with IUGR the liver size was small as compared with the control fetus.

We conclude from this study that measurements of fetal liver size aid in assessing liver development and also intrauterine growth of the fetus.

### 178. Prospective Study with Antenatal Diagnosis of Congenital Heart Disease and Fetal Arrhythmia

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Fetal echocardiographic and Doppler ultrasonographic prospective studies were performed on all fetuses who delivered at Hirata Municipal Hospital from May '84 to June '86. Two or three ultrasonographic examinations were performed on each fetus between 20 weeks of gestation and term. Three congenital heart anomalies (1.0%) and twelve fetal arrhythmias (4.01%) were diagnosed antenatally, but three heart anomalies (two were small ventricular septal defects, and one was moderate pulmonary stenosis) (1.0%) were overlooked in utero. The fetal echocardiography should be a pertinent tool for obstetrician and perinatologist to diagnose and manage the infant of congenital heart disease and fetal arrhythmia.

### 179. Retrospective Study on this 5 Years' Perinatal Management for Congenital Heart Disease

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75 cases of fetal and/or neonatal cardiac disorder encountered in last 5 years (Jan. 1st. '82 Feb. 28th. '87) were 11.4% in total deliveries (including referred patients).

48 patients were fetal arrhythmias, and 27 were CHD (ASD 8, VSD 7, CAVC 4, Cardiac tumor 2, PS, PA, HLHS, DORV, Ebstein, EFE, Myocarditis).

14 cases of CHD were pointed out some abnormalities prenatally and 8 cases were diagnosed exactly same as postnatal evaluation.

13 cases were false negative prenatally, almost all of them were ASD or VSD. (10 cases of them were so-called High risk pregnancy.) 2D-colour flow mapping was expected with its possibility for detection of their inter septal flow. In addition, evaluation for fetal cardiac function with maximum flow velocity of fetal descending Aorta (V max) and fetal cardiac ejection fraction were useful to precise perinatal management.

Screening with 4 chamber view and evaluation with V max, EF, and colour flow mapping as a substitute for angiocardiogram were helpful not only pre-natal diagnosis but also perinatal management.

### 180. Effect of Regionalization on the Prognosis of Very Low Birth Weight Infant at a Tertiary Perinatal Center in North Japan