no change. Ac-Mo values were almost constant during deceleration and acceleration. 2) In 5 abnormal cases diagnosed by late decleration, severe variable deceleration or bradycardia, 4 showed continuous shortening of T-Ao. One had prolongation after its shortening. Two cases showed abnormal Ao-Ac values in some FHR range.

226. Automatic Fetal Distress Diagnosis Utilizing Microcomputer with the External Monitoring Technique

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A new machine for automatic diagnosis of fetal distress with alarm is developed utilizing microcomputer. The outputs of autocorrelation fetal heart rate meter and external tocodynamometer are connected with the microcomputer system. The signals are sampled with 2 second's interval in every sequential 5 minutes, and the result of diagnosis is printed out by dot impact printer after analysis. The parameter is fetal distress index which is determined by FHR score and abnormal FHR pattern. Total fetal distress index is calculated in recent 15 minutes for diagnosis. According to the index, "fetal distress", "its suspect" or "warning" is diagnosed and alarmed.

Automatic diagnoses were performed in 52 patients. "Established fetal distress" was diagnosed in 4 patients including a case of severe bradycardia under 100 bpm with no recovery in 5 minutes. Then, "suspect of fetal distress" in 5 patients, "warning" in 10 patients and "normal" in 33 patients. Automatic diagnoses were almost coincided with manual diagnoses.

Sequential results of automatic diagnoses were compared between "normal" and "fetal distress" cases. The latter was typical late deceleration accompanied by smooth baseline. The levels of LTV amplitude and frequency, FHR score and fetal distress index are clearly differentiated between the 2 cases.

227. Assessment of Fetal Well-Being with the Combination Method: Fetal Breathing Movement (FBM) and the Non-Stress Test (NST)

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Two hundred forty-one observations of the non-stress test were made in 241 patients and judged according to our NST criteria. One hundred twenty-nine observations of the combination method were made in 129 patients with real-time B scanner and judged by its % time spent breathing.

In NST alone, a normal Apgar score ($\geqq$8) was observed in 212 of 218 patients (92.7%) with reactive NST. An abnormal Apgar score ($\leqq$7) was observed in 12 of 23 patients (52.7%) with non-reactive NST.

In FBM alone, a normal Apgar score was observed in 84 of 90 patients (93.3%) with higher % time spent breathing ($\geqq$20%) and an abnormal Apgar score was observed in 14 of 39 patients (35.9%) with lower % time spent breathing (<20%).

In the combination method, a normal Apgar score was observed in 84 of 86 patients (97.7%) with both reactive NST and higher % time spent breathing. An abnormal Apgar score was observed in 8 of 11 patients (72.7%) with both non-reactive NST and lower % time spent breathing.

It was seen for the assessment of fetal well-being that the combination method was reliable as compared with NST alone.

228. Clinical Significance of Fetal Heart Rate Variability

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The present study was designed to analyze fetal heart rate (FHR) patterns in 10 patients who exhibited progressive fetal distress. These patients were admitted to our hospital with a diagnosis of toxemia of pregnancy in 24-34 gestational weeks.

FHR monitoring was performed daily or at more frequent intervals according to fetal and maternal condition. When FHR pattern revealed persistent late deceleration (LD) and/or brady-cardia (BC), induction of labor in 2 cases or cesarean section in 7 cases was carried out for rescue of the babies. In the

remaining one cases, induction of labor was initiated after fetal death.

The clinical courses observed in the series of the present study were summarized as follows; (1) The interval between the onset of loss of variability (LOV) and the delivery was 9.3 ± 1.5 days (m. ± S.E.), (2) The interval between the onset of occasional LD and the delivery was 5.6 ± 0.5 days (m. ± S.E.), (3) Acceleration disappeared with the occurrence of LOV, (4) In the case with fetal death, persistent LD was followed by BC, resulting in fetal death 12 hr after the first detection of persistent LD, (5) In 7 cases with cesarean section, all babies did not exhibited any serious complications, while in 2 cases with vaginal delivery, one baby died on the 3rd neonatal day.

229. Obsective Recognition of Fetal Movements Concerning to FHR Acceleration and its Clinical Applications

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In normal pregnant women (from 29 to 40 gestational weeks), the fetal head and trunk rolling movements were observed and simultaneously maternal perceptions of fetal movements were recorded. From the analysis of these date, we found 76.7% of fetal rolling movements could be detected by observation of head only and 72.4% with trunk observation only. The other-hand maternal perception could find 28.5% of fetal rolling movements.

These results show us that the most effective method to recognize the fetal movements may be to observe the fetal head by a single real-time B scan.

Using the above mentioned head rolling movements we defined the appearance ratio of FHR accelerations against fetal movements at Non-Stress-Test. 159 cases (including high-risk pregnancies) were studied. In 154 cases normal outcomes were obtained and the appearance ratio was found as 93.6%. But 5 cases which ended as intra-uterine death or early neonatal death, showed 0 to 29.9% of poor appearance ratio on at least 3 days before these final end.

230. Subjective Fetal Movements and Decrease Rate in the Case of Latent Fetal Distress

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To evaluate subjective fetal movement as a screening method for detection of latent fetal distress, the following study was performed.

Pregnant women were asked to count fetal movements and that number was converted into 12-hours values per day. This measure was termed the daily fetal movements count (DFMC). DFMC and its decrease rate were compared in 243 pregnant women—98 suspected of latent fetal distress, 49 showing poor outcome and 109 normal.

In normal pregnancy DFMC was found highest in 32 weeks of pregnancy and decrease rate showed 57% average in 40 weeks of pregnancy. Although suspected of latent fetal distress group and poor outcome group gave no distinctive mean FDMC during pregnancy from that of normal group, the decrease rate was higher. 66% of cases having the average decrease rate for 1-7 days before delivery of 80% or over and 8% of cases having said rate of less than 80% were among poor outcome group.

From above findings the decrease rate of DFMC appeared useful for diagnosing latent fetal distress.

231. Daily Activity during Pregnancy and Uterine Contraction

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Using teletocodynamometry and home-TCD, we have investigated the effect of daily activity during pregnancy on the uterine contraction and the following results were obtained.

1) Ambulation causes uterine contraction.