



Short Communication

Hypoxic Fetal Brain Damage Followed by Cerebral Palsy will be Prevented by Computerized Fetal Monitoring

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The fetal heart rate recording curve (FHR) was the mostly useful diagnostic tool to detect fetal risk in the birth process, instead of listening to fetal heart sound, mother's abdominal fetal ECG, PCG and ultrasound CW Doppler fetal heart detector, while the subjective FHR pattern diagnosis had been widely used in the world since 1968, but it was based on subjective visual pattern recognition, where the diagnosis was disturbed by vague definition and observer difference [1]. The author noticed its controversy nature based on subjective human visual FHR observation, and created objective numeric FHR analysis in 1969 and created objective and numeric FHR analysis to achieve FHR score, which was determined every 5 min, and correlated neonatal Apgar score and umbilical cord blood pH, and precisely predicted neonatal well using and asphyxia using the regression equations to neonatal Apgar score and UApH [2]. Neonatal asphyxia was predicted by FHR score even in the first stage of labor. The author programmed the FHR score introducing it to computerized FHR analysis. In addition, recently, the author noticed vague nature of FHR late deceleration, then he changed transient FHR deceleration (FHR decrease) to objective analysis measuring the duration of transient FHR deceleration, of which heart rate clearly correlated PaO₂, if it is lower than 50 mmHg, and fetal PaO₂ was 50 mmHg or low, then fetal hypoxia is suspected by the summation of deceleration duration (min) divided by the lowest heart rate (bpm) in the full course of fetal

monitoring, and multiplied by 100, and named it hypoxia index (HI) [2-4].

The HI of 2-3 late decelerations was low, but high after long repetition, then HI was 25 or more developing the loss of FHR variability, that developed by the response of fetal brain to minor fetal motion, thus the loss of variability is followed by fetal brain damage and cerebral palsy. The regression equation of HI predicted neonatal Apgar score, vague nature of late deceleration was clarified, and simple HI covered early, late and variable decelerations explained by above theories, in addition the risk of acute sudden continuous fetal bradycardia followed by neonatal hypoxic ischemic encephalopathy (HIE) will be predicted.

In summary, the long-term HI evaluation through whole course of labor made it possible to prevent intrapartum damage of fetal brain followed by the cerebral palsy by timely caesarean delivery before the HI is 25. The fetal brain damage was rare and one in 5,000 births, however, they are 200 in 1,000,000 births in a year in Japan. Pediatric doctors wait the decrease of cerebral palsy from the intrapartum fetal monitoring. The reduction of cerebral palsy can be successful applying such objective FHR diagnosis as FHR score and hypoxic index, particularly in computerized diagnosis.

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