A study on the Relationship between Simple Single Umbilical Artery and Neonatal Hypoxic-Ischemic Encephalopathy

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Keywords: Obstetrics, Fetus, Single Umbilical Artery, Clinical Analysis

Abstract: By analyzing the obstetric clinical cases of single artery (SUA), the clinical diagnosis and management of single artery can be further improved. In this method, 37 single time artery cases which were removed and diagnosed in our hospital were analyzed retrospectively. 37 cases were randomly selected as the control between the cases of pregnancy complicated and the cases of non single umbilical artery. Prenatal ultrasound, S / D ratio changes of fetal heart rate and electronic monitoring results: 37 cases of single artery were found in 1.7,93 delivery, the incidence was 0.23%. Among them, the incidence of single artery was 61.86% in 24 cases and 33.14% in 13 cases. 32 cases were examined by ultrasound before birth, the diagnostic coincidence rate was 90.62%, 8 cases of birth defect was 21.62%. The birth rate was 21.62%, 28 cases were diagnosed before birth, chromosome abnormality was 3.57%, premature delivery was 1.2%, perinatal mortality was 3.8%, perinatal mortality was 8.10%, FGR, fetal distress, S / D ratio increased abnormally. The electronic monitoring of abnormal fetal heart rate was significantly higher than that of non single artery. Conclusion: the mortality of single umbilical artery is higher in birth defects, FGR, fetal distress, premature delivery and perinatal period. Most fetuses with single umbilical artery have good results. In prenatal ultrasound examination, it was found that the fetal system should be carefully examined due to the abnormal morphology and structure of single artery. In the case of continued pregnancy, dynamic monitoring is needed to strengthen the monitoring of fetal intrauterine development.

1. Introduction

There are two umbilical veins and one umbilical vein in normal umbilical artery. The umbilical artery (SUA) refers to that there is only one umbilical artery in the umbilical cord, and other umbilical arteries do not. It's one of the congenital abnormalities of a normal fetus. The incidence of single artery is not high, but it is often related to other structural malformations, chromosomal abnormalities, fetal growth restriction (FGR) and perinatal death[1]. The annual distribution volume of our hospital is more than 5000. In this paper, a large number of samples were used to analyze the incidence of single umbilical artery, pregnancy outcome and countercurrent analysis, hoping to further improve the clinical diagnosis and management of single umbilical artery.

2. Materials and Methods

2.1. Clinical Data and Methods

From January 2006 to December 2008, the data of pregnant women who gave birth in our hospital were selected, and the occurrence of single artery, pregnancy outcome and process were analyzed retrospectively[2]. There were 15793 people born in 3 years, 37 of them had one umbilical artery, the incidence was 0.23%. Thirty-seven cases of pregnancy with and without complications were randomly selected. The pregnancy results, prenatal ultrasound, S / D ratio changes and fetal heart rate electronic monitoring of SUA were analyzed. Pregnant women are 20 to 43 years old,

  DOI: 10.25236/medsbe.2020.038

with an average age of 23.

2.2. Ultrasonic Device

In order to screen the fetal malformation system, ultrasound doctors in the prenatal diagnosis center of our hospital used the color Doppler ultrasound system of ACUSON Sequoia 512 and voluson 730.

2.3. Statistical Methods

In order to calculate 2 and P values, chi square test was used. $P < 0.05$ was significantly effective. The home color Doppler ultrasound system is selected by ultrasound doctors in the prenatal diagnosis center of our hospital. 3. Statistical method: in order to calculate 2 and P values, chi square test was used. The main congenital defects of SUA were pulmonary adenoma (1 case), fetal pleural ascites (1 case), total forebrain and cleft lip and palate (1 case), diaphragmatic hernia (1 case), scrotal initiation (1 case), polydactyly (3 cases), and 2 cases were selected for labor treatment. One case of non SUA congenital defect was multiple finger deformity and abdominal hemangioma. The incidence of neonatal defect, FGR and fetal pain was higher in SUA than in non SUA. There was no significant difference between the two groups. Ultrasound examination of SUA during pregnancy: 32 cases of prenatal ultrasound, 29 cases of simple artery. Ultrasound showed that the gestational weeks of SUA ranged from 13 to 36 weeks, with an average of (25 ± 6) gestational weeks, which were almost found in the screening of b-pattern abnormalities in the second semester. Among them, 20 cases were diagnosed as single cord blood artery and 13 cases as well as more than one abnormal sign and combination of ultrasound, 4 cases were in oligohydramnios, 4 cases had too much amniotic fluid, 8 cases were structural abnormalities (3 cases of renal pelvis and exfoliation, 1 case of left ventricular グ レ ア 1 was strong echo), 1 case of pleura, 1 case of ascites, 1 case of cleft lip and jaw, 4 cases of fetal development restriction (FGR)[3]. SUA: 28 cases of prenatal diagnosis, 16 cases of cord blood, 12 cases of amniotic fluid, 3 cases of chromosomal abnormalities, xyq + 9, XX, inv 9, xyq, 9, XX, in 9 are normal chromosome polymorphisms. Therefore, the incidence of true chromosomal abnormalities was 3.57% (1 / 28).

3. The Occurrence of Single Umbilical Artery

3.1. The Cause and Mechanism of Umbilicus Artery are Unknown

In fact, whether the primitive umbilical artery primordium is undeveloped or whether the secondary occlusion of the cord is caused by the stimulation of the embryo cannot be concluded. However, the remaining artery occlusion was found in the pathological anatomy. At the same time, the incidence of single umbilical artery is 0.1% in the genetic study, and the clinical observation is 0.59% - 1%, which shows that the main reason may be the late occlusion of one umbilical artery. 1988, nvber et al. [2] the chromosome of children with unilateral artery is 13-fold and 13-fold. Since then, they have triploids, 45, x, t (9; 17) and find it easy to balance. It is generally believed that chromosome abnormality such as single artery is related to the occurrence of chromosome abnormality.

3.2. The Occurrence of Single Umbilical Artery

The incidence of single umbilical artery reported by different companies may be related to different examination methods, experience and standards. From 1996 to 2004, 20998 pregnant women were examined by color Doppler ultrasound in Xiaoming Hubei maternal and child health hospital. 22 cases of one hour artery were confirmed as pathology after operation or after delivery. The incidence was 0.11%. Du liming, et al. [4] ultrasound was used to detect 9.266 cases, SUA was used to detect 47 cases, and SUA related fetal malformation was 57.4%. From January 2006 to December 2008, 15793 cases were diagnosed. Mainly through ultrasound, post delivery examination, pathological examination to diagnose. One case was umbilical artery, 37 cases in total, the incidence was 0.23%. That's not quite the same rate as reported in the literature.

3.3. Effect of Fetal Umbilical Artery on Fetal Blood Circulation: It is Known that the Umbilical Artery is Negative

In order to exchange substances with maternal blood, the important organ of placental villi is responsible for delivering fetal blood with low oxygen content. If the fetus lacks the umbilical artery, will it affect the blood circulation of the mother and fetus? According to reference , most umbilical artery pregnancies are combined with abnormal fetal umbilical blood and arterial blood flow indexes, even if there is no related malformation, IUGR may increase the risk. In this group, the abnormal increase rate of FGR and S / D of umbilical artery in the third week of pregnancy was significantly higher than that of non SUA. SUA may affect fetal blood circulation. Therefore, if the S / D ratio of the umbilical artery is abnormally high, we should pay attention to the number of umbilical vessels. It is necessary to early diagnose the abnormalities of the umbilical artery or other fetal systems.

Table 1 Gender comparison of two groups of patients

Group	Number of cases	Male	Female
Ulnar tibial acupuncture group	60	43	17
Wrist ankle acupuncture group	60	46	14

3.4. The Influence of Cord Blood on the Prognosis of Fetus

Structural abnormalities and abnormal blood supply increase perinatal mortality. The fetal mortality rate of umbilical artery was 4.9%, which was 5 times higher than that of normal fetus. However, some scholars believe that the high perinatal mortality of single umbilical artery fetus may be caused by combined malformation and / or chromosomal abnormality. In this data, the congenital defect of SUA newborn was significantly higher than that of non SUA newborn. All of the three quiesces have different structural anomalies. A case of triazine 13 was found in prenatal diagnosis as an inducement of labor [5]. Perinatal death is closely related to fetal abnormality. The incidence of NST and CST abnormalities and fetal pain in fetal heart monitoring were significantly higher than those in non SUA. After active treatment, there was no statistical difference in the incidence of neonatal pseudo death between the two groups, no neonatal death. This shows that most fetuses with single umbilical artery have a good prognosis[6]. However, under the uterine contraction load, the fetus in a single artery has a tendency to suffer in a poor umbilical cord circulation, which is found as abnormal CST. We should pay close attention to the labor process and uterine conditions, and pay attention to the pain and stillbirth of the fetus.

Table 2 Age control of two groups of patients

Group	Number of cases	-30	-40	-50
Ulnar tibial acupuncture group	60	18	25	17
Wrist ankle acupuncture group	60	15	27	18

4. Clinical Management of Umbilical Artery before and after Delivery

If it is combined with other more serious malformations, a fetus with umbilical artery is easy to diagnose, and most of these fetuses have higher natural mortality, and it is easier to make clinical management decisions. However, most of the fetuses with single umbilical artery grew well in the uterus, had normal weight at birth, and had good pregnancy results. In conclusion, prenatal ultrasound of a single umbilical artery requires careful examination of various fetal systems in order to detect morphological and structural abnormalities. Chromosome examination of amniotic fluid and cord blood should be recommended. Some scholars believe that 5% of the fetal umbilical arteries have complex heart malformations, so it is necessary to do fetal heart color Doppler ultrasound regularly. At present, our hospital's umbilical artery treatment in pregnancy 11 to 14 weeks, the fetal neck transparent layer screening[7]. Screening of fetal malformation system at 20-

24 weeks of gestation, number of blood vessels in umbilical cord and number of Down's syndrome at 22-26 weeks of gestation, ultrasonic examination of umbilical cord blood vessels or other chromosomal abnormalities, information selection for prenatal diagnosis if pregnant women and their families and communication. B ultrasound can monitor the growth of the fetus in the uterus and abnormal ultrasound examination, so as to continue pregnancy. At the 34th week of pregnancy, the S / D status of umbilical artery was detected by obstetric Doppler, and NST was performed once a week[8]. Please input the electronic monitoring of fetal heart rate. Through standard prenatal examination, we effectively reduced the results of single umbilical artery assisted pregnancy.

5. Conclusion

Umbilical blood vessels are the transport pathway of fetal nutrients and metabolites. When the number or structure of umbilical vessels is abnormal, the transmission of nutrients and metabolites will be affected[9]. When the umbilical artery is ischemic, the fetus can transfer the venous blood from the placenta to the placenta through the umbilical artery.

Acknowledgements

This research has been financed by The scientific research project of education department of hunan province in 2019, "development and research of practical teaching system of obstetric ultrasound image virtual simulation". (19C0229).

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