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Analysis of Etiology, Diagnosis and Treatment of Neonatal Pathological Jaundice

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ABSTRACT **Objectives:** To investigate the causes of neonatal pathological jaundice and provide the basis for clinical diagnosis and treatment. **Method:** The clinical data of 120 cases of neonatal jaundice were analyzed retrospectively. **Results:** In the cause of the disease, 22 cases of neonatal asphyxia, accounting for 21, 17.50% cases of breast feeding, accounting for 13, 10.83% cases of ABO hemolytic disease, accounting for 24.17%, 8 cases of cesarean section, accounting for 6.67%, 5 cases of premature delivery, accounting for 4.17%, 6 cases of intracranial hematoma, accounting for 5%. Infection, breast feeding, neonatal asphyxia, ABO blood group incompatibility is an independent factor. 120 cases were cured and discharged. No serious sequelae and dysfunction occurred. **Conclusion:** To strengthen the perinatal health care, and pay attention to the prevention and treatment of risk factors, such as infection, neonatal asphyxia, and the use of appropriate breast feeding, can effectively reduce the incidence of neonatal pathological jaundice.

KEYWORDS
Newborn
Pathological jaundice
Etiology

1. Introduction

Neonatal pathological jaundice is a common disease in newborn babies. The central link of treatment is the prevention and treatment of bilirubin encephalopathy which the level of serum bilirubin and indirect bilirubin levels cannot be the guide of the treatment. The author aims to analysis on the cause and diagnosis and treatment of neonatal pathological jaundice [1].

2. Materials and methods

2.1. General information

A total of 120 cases of neonatal pathological jaundice in children were selected from June 2008 to October 2014 in our hospital including 72 cases of male,48 cases of female where 96 cases for full-term infants and 24 cases of premature infants.

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2.2. Diagnostic criteria

All patients were in accordance with the provisions of the diagnostic criteria of neonatal pathological jaundice: jaundice appears within 24 hours after birth and blood bilirubin concentration >102 μmol/L; serum bilirubin concentrations of full-term >220.6 μmol/L; premature infants >255 μmol/L; the serum direct bilirubin >26 μmol/L; serum bilirubin values every day of rise in value more than 85 μmol/L; jaundice lasted more than 2–4 weeks, or Jaundice were of aggravating.

2.3. Method

2.3.1 Detection method

Admission underwent routine blood test, blood culture, CRP, total abdominal B-mode ultrasound, chest, total bilirubin, liver function, torch, thyroid function, biochemical, Coomb test experiment and special examination according to the disease and illness choice.

2.3.2 Treatment

(1) The cause of the disease was treated with corresponding treatment.

(2) Drug treatment enzyme inducer: Phenobarbital 4–8 mg/kg daily; glucocorticoid: choice of throwing prednisone daily 1.2 mg/kg, dexamethasone daily initial dose of 0.3–0.5 mg/kg, drug regulation of intestinal bacteria group also use as to reduce bilirubin intestinal reabsorption. For

medicine treatment, it is depending on the age of the children of selective use of *Yinchenhao* Decoction.

(3) Phototherapy: In a standard operation the babies were lies in incubator and were exposed to the light with 60% humidity and temperature at about 30 degrees. For phototherapy process to continue, the baby is undressed and baby's eye were covered with black paper as well as the testis were sheltered and protected.

(4) The severe of a nuclear jaundice risk can selectively use blood transfusion therapy.

2.4. Statistical analysis

Data analysis using SPSS 13.0 software package.

3. Results

From the statistical results, in the cause of disease, 22 cases of neonatal asphyxia, accounting for 21, 17.50% cases of breast feeding, accounting for 13, 10.83% cases of ABO hemolytic disease, accounting for 24.17%, 8 cases of cesarean section, accounting for 5, 6.67% cases for early production, accounting for 4.17%, 6 cases of brain hematoma, accounting for 5%. As in Table 1.

Table 1. Analysis of the causes of neonatal pathological jaundice.

Pathogeny	Cases	Percentage (%)
Neonatal asphyxia	22	18.33
Cesarean section	8	6.67
Cranial hematoma	6	5.00
ABO hemolytic disease	13	10.83
Improper breast feeding	21	17.50
Infected	29	24.17
Congenital factor	2	1.67
Unknown reason	3	2.50
RH hemolytic disease	2	1.67
Scleredema	1	0.83
Thyroid function is low	1	0.83
Preterm birth	5	4.17
Drug	4	3.33
Premature rupture of membranes	1	0.83
Other	2	1.67

From the statistical results can be found that the infection, ABO blood group incompatibility, breast feeding and neonatal asphyxia are the independent factors of neonatal pathological jaundice, as shown in table 2.

A total of 120 cases were cured and discharged. There is no serious neurological sequelae and dysfunction of the nervous system.

4. Discussion

Neonatal jaundice is mostly physiological jaundice and also physiological phenomenon in the neonatal period in which do not need special treatment. Neonatal pathological jaundice is caused by many factors, and the main factors of neonatal pathological jaundice in the early stage of neonatal pathological jaundice are hemolytic factor, the infection factors and breast milk feeding factor. In addition, perinatal asphyxia anoxia in babies can cause acidosis and hypoglycemia. When there is low temperature, it can inhibit liver enzyme activities which later affect the bilirubin intake of the liver for producing serum bilirubin. Suffocation of gastrointestinal dysfunction whereby inadequate oxygen intake, declining of defecate latency will cause an increase of bilirubin enterohepatic circulation. Moreover, inadequate intake of glucose will lead to lack of glucuronic acid and increase the bilirubin thus aggravating the jaundice. Besides that, Erythrocytosis (the hemolysis of red blood cells in blood vessels) can also cause internal bleeding after the bilirubin is absorbed and aggravate jaundice to the children. As red blood cell damage is increased the level of bilirubin is also increased. Moreover, anesthesia in cesarean section will pass through the placenta into the blood circulation and causing fetal intestinal peristalsis is abated. As a result, meconium discharge is decreased, thus increase the bilirubin enterohepatic circulation as well increased the red cell membrane permeability. Cesarean delivery procedure will make fetal respiratory function set up is not perfect for the first time. Blood oxygen partial pressures of fetal oxygen saturation were increased as erythrocyte will deposited after birth. The increase of red blood cell damage is associated with increased bilirubin. The use of antibiotics in post-operative infection preventive will pass through into newborn babies with the breast milk into the intestinal tract. Later, the antibiotics can kill the intestinal existing obligate anaerobic bacteria, such as bifidobacterium, thus give an effect to the neonatal intestinal flora. When combined with bilirubin of intestinal absorption, this will increase enterohepatic circulation of jaundice.

The pathogenesis of neonatal pathological jaundice, it is

Table 2. Logistic regression analysis of the cause of neonatal pathological jaundice.

Factor	Regression coefficient	Standard error	OR Value	*p* Value	Dominance ratio
Infected	2.23	0.74	1.175–4.416	0.003	9.31
ABO blood group incompatibility	0.173	13.406	1.016–23.523	0.000	1.189
Improper breast feeding	1.8	0.57	0.590–13.456	0.002	6.04
Neonatal asphyxia	-0.321	7.749	0.145–2.452	0.005	0.725

not fully understood. It is believed that the infection, ABO blood group incompatibility, improper breast feeding and neonatal asphyxia are the independent factors of neonatal pathological jaundice. Among them, in the breast milk jaundice, it is generally believed that the activity of the milk in the breast milk in which rich in content reduce the decomposition of bilirubin. Glucose acid ester bonds is a part of bilirubin which is responsible to inhibit hepatic glucoronyl tranferase and again lead to decreased the conjugation thus resulting non conjugated bilirubin increased. Unconjugated bilirubin is quickly absorbed by the intestinal tract, into the intestines and liver circulation, so that the concentration of biliruibin in the blood is increased and cause jaundice [2]. On the other hand, inappropriate breastfeeding methods may also cause jaundice, called breast-feeding jaundice. This is due to maternal lactation deficiency or lactation session is decreased by delayed meconium excretion hence increased the enterohepatic circulation of bilirubin. Therefore, regularly breastfeeding is needed so as to promote the meconium excretion and reduce bilirubin absorption. As a result it will help in reducing the feeding jaundice occurrence probability. Further, as the emergence of neonatal asphyxia (the lack of oxygen) and the process of the anaerobic fermentation of glucose are increased this will lead to elevating the metabolic acidosis. In fact, it will cause a problem to the ability of carrying oxygen in the red blood cells and thus disturb the organization of the cycle of oxygen which later gives an impact to the liver on bilirubin intake. This matter is also leading to the occurrence of jaundice [3]. At the same time, the neonatal asphyxia may also affect most of the digestive tract organs whereby disturbing the function of its secretion and movement disorders. As a consequence, causing abdominal distension and constipation thus increase occurrence of jaundice. Studies have found that postpartum, neonatal asphyxia, hypertensive disorder complicating pregnancy, umbilical cord and placental factors, abnormal fetal position and prolonged labor delivery methods are closely related. On all of that, acceleration infection of the red blood cell coupled with the inhibition of enzyme activity in the liver or infection virus to the liver cells will leads to the occurrence of jaundice. The occurrence of hemolytic disease of the newborn is causing by direct, indirect and total bilirubin content. The treatments for neonatal pathological jaundice are by phototherapy, drugs, blood transfusion and other. Phototherapy is a most effective method. However, attention is necessary for irradiation intensity when handling phototherapy session as adhere to the principle of individual where different gestational age of children will have different disease state. On the other hand, for high risk of nuclear jaundice treatment, exchange transfusion is the most effective method which can timely remove antibody and red sensitive cells thus reducing hemolysis, the serum bilirubin concentration and lowers the hyperbilirubinemia [4]. Combined with the existing research results, the author believes that strengthening the perinatal health care, pay attention to the prevention and treatment of infection, neonatal asphyxia and other risk factors as well as the use of appropriate breast feeding way to feed will effectively reduce the incidence of neonatal pathological jaundice.

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