

# The incidence of infants with rotavirus enteritis combined with lactose intolerance

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**Abstract:** This study was to research the incidence of infants with rotavirus enteritis combined with lactose intolerance and the clinical effect of low lactose milk powder for infantile rotavirus enteritis with lactose intolerance. The control group were 126 cases of infants with diarrhea randomly collected from our hospital at the same period, which their rotavirus detection was negative. The observation group was 185 cases of infants with rotavirus, which was tested to be positive. Through the urine galactose determination, 62 cases of the control group were positive and 124 cases of the observation group were positive. Then 124 cases of infants with rotavirus combined with lactose intolerance were randomly divided into two groups. 60 cases in the control group were given rehydration, correction of acidosis, oral smecta, Intestinal probiotics and other conventional treatment, then continued to the original feeding method. While, 64 cases in the treatment group, on the basis of routine treatment, applied the low lactose milk feeding. To observe the total effective rate for the two groups. The incidence of lactose intolerance in children with rotavirus enteritis (67.03%) was significantly higher than that of children with diarrhea (49.2%), which was tested to be negative. And the difference was statistically significant ( $p < 0.05$ ). In the aspect of reducing the frequency of diarrhea, and diarrhea stool forming time, the treatment group has the obvious superiority. The total effective rate was 95.4% for treatment group, which was higher than that in the control group (76.7%), the difference was statistically significant ( $P < 0.05$ ). Conclusion: Infants with rotavirus enteritis was easier to merge with lactose intolerance. The low lactose milk powder could improve the therapeutic effectively and could reduce the duration of disease, and restored to normal diet for 2 weeks feeding time.

**Keywords:** Rotavirus enteritis; lactose intolerance; low lactose milk powder.

## INTRODUCTION

The rotavirus enteritis was common in infants under 2 years old and often occurred in autumn and winter. The rotavirus enteritis was a kind of acute diarrhea which was due to the invasion of rotavirus to intestinal epithelial cell and the dysfunction of the small intestinal absorption. The rotavirus enteritis was accounting around 40% of infantile disease in China. The main manifestations were vomiting, diarrhea, watery, and may be associated with acidosis, dehydration and electrolyte disorder, myocardial injury, and severe cases could lead to death. This disease often associated with lactose intolerance and caused d the protracted diarrhea. This research explored the incidence of lactose intolerance in infants with rotavirus enteritis and observed the efficacy of low lactose milk powder adjuvant therapy for infantile rotavirus enteritis combined with lactose intolerance through the urine galactose determination of infants with rotavirus enteritis.

## MATERIALS AND METHODS

### *Clinical data*

From September 2013 to July 2014, Women & Infants Hospital of Zhengzhou (Zhengzhou, China) inpatient

treatment was performed on children with pediatric iarrhea, 125 cases were diagnosed with rotavirus enteritis and complicated with lactose intolerance. Among the 125 cases, there were 67 cases of male, and 58 cases of female, who had diarrhea, vomiting, watery stools, fever and symptoms of different degrees of dehydration. Outpatient treatment was performed on 126 infants with diarrhea rotavirus negative, 70 cases of male and 56 cases of female. Then the 124 cases of children with rotavirus enteritis associated with lactose intolerance were randomly divided into two groups, as seen in table 1.

### *Laboratory examination*

Children with diarrhea were taken fresh stool to test on 1-2 admission day, and used ELISA to check stool rotavirus antigen (RV-Ag), to determine the urine galactose in the first 3-5 days. Urine galactose determination kit produced by Beijing Jinyu High-tech Diagnosis Technology Co., Ltd. and used the galactose oxidase method to test. The children with rotavirus enteritis had been urinated one hour before urinalysis and took food according to the eating habits before the onset of illness. Collecting the urine 2~3 hours after eating and mixing, if the color generation of the sample hole was in accordance with the color of the standard hole or lighter than that of the standard hole (faint yellow), it referred to lactose intolerance. If the color of the sample hole was darker

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**Table 1:** Comparison of the clinical data of two groups of children

Group Name	Total Case	Male	Female	Age (Month)	Vomit Cases	Fever Case	Frequency	Dehydration Cases	Course (day)
Control Group	60	33	27	12.2±4.8	27	18	7.2±2.5	18	2.7±1.2
Treatment Group	64	33	31	11.2±4.9	33	25	8.7±2.0	22	2.3±1.5

**Table 2:** The incidence of rotavirus enteritis with lactose intolerance was significantly higher than that of the control group.

Group Name	Cases	Lactose intolerance	Lactose tolerance	Morbidity (%)
Control Group	126	62	64	49.2
Treatment Group	185	124	61	67.03
X <sup>2</sup>	9.18			
P	0.002			

**Table 3:** Comparison of two groups of curative effect in children

Group Name	Cases	Markedly	Effective	Invalid	Total Effective Rate (%)
Control Group	60	19	27	14	76.7
Treatment Group	64	27	34	3	95.3
X <sup>2</sup>	6.954				
P	0.008				

than that of the standard hole (pink), it reminded lactose tolerance.

#### Treatment method

The control group with 60 cases were given fluid infusion, correcting acid, oral smecta, intestinal probiotics and other conventional treatment, in order to continue the original feeding way. The treatment group with 65 cases, on the basis of routine treatment, low lactose milk feeding (Wyeth EL element). The two groups were observed the treatment efficiency.

## RESULTS

Among the 185 cases of infants with rotavirus enteritis, the urine galactose determinations of 124 cases (67.03%) were positive. There were 126 cases of infants with diarrhea, which their rotavirus was negative and the urine galactose determinations of 62 cases (49.2%) were positive, as seen in table 2.

#### Curative effect judgment

To implement the standard (Fang *et al.*, 1998) of the 1998 National Symposium on the formulation of diarrhea disease prevention: (1) markedly: nature of stool and times within 72 hours of treatment returned to normal, the disappearance of clinical symptoms; (2) effective: within 72 hours of treatment significantly improved properties and the number of stool; (3) Invalid: within 72 hours of the nature of stool and statistically significant improvement even worse. The total effective rate (%) = (markedly + effective)/ The total quantity of cases.

#### The curative effect comparison

3 days after treatment, the total effective rate of treatment group was 95.4%, the comparison group total effectiveness was 76.7%. The difference was statistically significant (P<0.05), see table 3.

## DISCUSSION

The infection and pathogen city of rotavirus enteritis were mainly through the fecal-oral route, also through aerosol form through the respiratory tract. If treatment was performed on time, it could lead to the progressive deterioration of the illness, even death. Its pathogenesis destructed the microvilli structure, and lead to intestinal digestion and absorption dysfunction, and increased secretion and lead to (Medici *et al.*, 1998; Liao *et al.*, 2010) diarrhea, as rotavirus invasion of intestinal epithelial cells. The destruction of microvilli structure made the intestinal digestion and absorption dysfunction

Infants and young children's small intestinal villus epithelial cell lactose content in the highest of brush border, and rotavirus infection, intestinal epithelial cells was impaired, lactase levels were sharply reduced. In addition, lactase was also the target of rotavirus' attack, and it could lead to lower secondary lactase activity, and could not digest milk or lactose in milk by decomposition, non decomposition of lactose into the colon increased the pressure of intestinal permeability, Intestinal cavity water increased, thus aggravated the diarrhea (Dykibra and Jasminka, 2008; He *et al.*, 2008; Fang, 2011). It was

reported rotavirus enteritis was the highest in the incidence of lactose intolerance in children with diarrhea (Dykibra and Jasminka, 2008), which was consistent with the result of this research. If still given lactose rich diet, such as breast milk, cow milk etc. It was not conducive to the recovery of the disease, even aggravate the disease (He *et al.*, 2008). Low lactose milk powder contained low lactose could avoid aggravating the diarrhea due to the lactose intolerance, the children of other nutrients intake (fat and protein) and assist to be digested and absorbed, to ensure the normal nutrient supply.

The data of this group showed that the incidence of rotavirus enteritis associated with lactose intolerance was 67.03% in this experience and more than 60% of the children with rotavirus enteritis were lactose intolerance, in accordance with the relevant researches. In the meantime, it could be seen that the incidence of secondary lactose intolerance was higher in children with rotavirus enteritis, which provided theoretical basis for the treatment of low lactose milk powder. The efficiency and total effective rate of the treatment group was higher than that of the control group and using low lactose milk powder to feed the children with rotavirus enteritis complicated with lactose intolerance could relieve diarrhea, and shorten the course of disease. When the small intestinal villus epithelial completed the repair process, lactase activity returned back to normal level, breast milk or formula feeding could be recovered normally (Ren and Xu, 2013). Low lactose milk powder in the treatment of infantile rotavirus enteritis and lactose intolerance could improve the efficacy of conventional

treatment. In addition, the low lactose milk powder with natural milk flavor was easy to be accepted by children, at any time, it was easy to convert to breast, milk or ordinary formula milk. It was worthy of clinical promotion.

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