

Case Report

Neonatal Cholera

Dr.R.Nathan***, Dr.P.Suresh**, Dr.J.Antony*, Dr.P.Venkateswaran**, Dr.S.Thayumanavan***

*Assistant Professor, **Associate Professor, ***Professor (Retd.), Chettinad Hospital and Research Institute, Chennai, India



Dr.R.Nathan graduated from the University of Gorakhpur in 1993 and pursued MD in Paediatrics from the University of Mumbai in 2000. He worked in Kanchi Kamakoti Childs Trust Hospital, Chennai and Pondicherry Institute of Medical Sciences, Pondicherry before joining this institute. He is presently working as Professor of Paediatrics and his fields of interest include nutrition and neonatology.

Corresponding author - Dr R.Nathan (drnathan@rediffmail.com)

Abstract

Neonatal Cholera is one of the rare clinical presentations. Occurrence of cholera in a new born reflects the poor hygienic condition of the family and bad child rearing practices. As therapy is primarily aimed in treating this particular condition, the broader perspective is to impress upon the population about hazards of bottle feeding and good hygienic measures.

Key words : Neonatal Cholera, lower economic strata, bottle feeding.

Chettinad Health City Medical Journal 2013; 2(3): 94-95

Introduction

Cholera is an acute debilitating diarrhoea disease causing morbidity and mortality among lower socioeconomic status people in tropical countries. It does occur in neonates, though rare. We report a 27 day old neonate who had clinical features consistent with cholera.

A 27 day old female neonate born to G2P1 mother presented with history of loose stools and vomiting of 1 day duration. Loose stools were 15-20 times, watery, curdy white and had fishy odour. Baby had 5 episodes of non bilious vomiting. There was history of abdominal distension, reduced urine output for 10 hours duration, lethargy and refusal of feeds. Baby was being bottle fed with diluted cow's milk. There was no history of fever and seizures. There was a similar family history of loose stools in the older sibling and they were from poor socioeconomic background. On examination baby was irritable with sunken eyeballs, depressed anterior fontanelle and dry oral mucosa. There was reduced skin turgor prolonged capillary filling time and feeble peripheral pulses, HR-170/mt and RR-60/mt. There was abdominal distension and bowel sounds were heard.

Blood investigations showed evidence of neutrophilic leucocytosis and hyperglycemia. There was no azotemia and dyselectrolytemia. CRP and Blood culture were negative.

In view of acute onset of profuse watery diarrhoea with fishy odour along with signs of severe dehydration with the background history of bottle feeding and elder sibling with similar history, provisional diagnosis of neonatal cholera was made.

Stool sample was sent for hanging drop examination and culture. Stool examination showed darting motility on hanging drop method. Stool culture showed growth

of *Vibrio cholerae* Ogawa type on Blood Agar/TCBS medium. (Fig.1) Baby was immediately resuscitated with Ringer Lactate. Baby was treated with erythromycin.

Discussion

Cholera is caused by *Vibrio cholerae* a gram negative nonspore forming curved rod with a polar flagellum. *Vibrio cholerae* strains O1 and O139 are the pathogenic strains. The two biotypes of *vibrio cholerae* O1 are classic and eltor type¹.

Vibrio cholerae has 2 major O antigenic type-Ogawa and Inaba and unstable intermediate type-Hikojima².

Cholera rarely occurs under two years of age³. Cholera diarrhoea is extremely rare in neonates. Colostrum may offer potent protection among breast fed neonates mediated by specific immunoglobulin IgA7. In India, Cholera is endemic and affects usually the 3 to 5 year old age group. There have been occasional reports in neonatal period with *Vibrio Cholerae* O139 in Bengal⁴.

Vibrio cholerae once ingested in significant amount especially in an environment where gastric acidity is compromised, colonises upper small intestine. Here it produces enterotoxins -Cholera toxins which stimulates adenylate cyclase resulting in raised c-AMP levels causing decreased absorption of sodium and chloride by intestinal villi and increased active secretion of chloride by crypt cells, hence resulting in high voluminous diarrhoea¹.

The genome of *Vibrio cholerae* O1 biotype Eltor comprises of two circular chromosomes, a large chromosome of 3 million bp and small chromosome of 1.07 million bp. The most important presenting feature in symptomatic patient is massive loss of fluids and electrolytes. The incubation period varies from 6 hours to 5 days.

Baby may present with low grade fever, vomiting and diarrhoea. Diarrhoea in severe cases is profuse, painless, rice water in consistency with fishy odour with occasional flakes of mucus. Babies present with tachycardia, tachypnea irritability, sunken anterior fontanelles, poor skin turgor and may even progress to stupor, circulatory collapse and renal failure.

Fluid loss may persist even upto 1 week. Laboratory investigations reveal neutrophilic leucocytosis, raised serum protein, elevated haematocrit, hyponatremia, hypokalemia and acidosis⁵. The clinical diagnosis is confirmed by stool for hanging drop method and stool culture which shows vibrio cholera growth in thiosulphate citrate bile sucrose medium and Tellurite taurocholate gelatin agar (TCBS). Rapid diagnostic technique with DNA based methods, ie polymerase chain reaction using primers for ctx A gene and outer membrane protein OmpW gene are described². Treatment is done by immediate rehydration with parenteral fluids and oral rehydration solution to be initiated. The drugs used for specific treatment are tetracycline, Doxycycline, Trimethoprim-sulphamethoxazole, erythromycin, Furazolidone and quinolones.

Complications include seizure, dyselectrolytemia, acute tubular necrosis, hypokalemia, arrhythmia, paralytic ileus, hypoglycemia or hyperglycemia and even death⁵.



Tellurite taurocholate gelatin agar (TCBS) & Blood Agar plates showing growth of vibrio cholera.

Diarrhoea in newborn should be investigated as the infection can cause bacteremia which has grave prognosis. Various studies have shown stormy clinical course including death if the neonate presents with bacteremia⁷. The newborns presenting with mild

diarrhoea had a favourable outcome when treated with erythromycin and rehydration fluids³. The common risk factors associated with neonatal cholera are poor sanitary condition, bottle feeding, household exposure (sibling with diarrhoea) and hypochlorhydria. The early events of infection or invasion could have occurred before the first colostrum feed probably during birth from a mother with asymptomatic stool carriage⁷.

Cholera can be prevented by phenol - killed bivalent cholera vaccine, but in tropical and developing countries personal and environmental hygiene is the only method to prevent this dreaded disease². *Vibrio Cholerae* is not uncommon in neonates presenting with diarrhoea in cholera endemic countries⁶.

References

- 1) Harris JB, LaRocque RC, Qadri F, Ryan ET, Calderwood SB. Cholera. *Lancet* 2012 Jun 30;379(9835):2466-76.
- 2) Ananthanarayan R, Jayaram Paniker CK. *Vibrio*. Text Book of Microbiology, 7th edition; 309-310.
- 3) Khan AM, Bhattacharya MK, Albert MJ. Neonatal Diarrhoea by *Vibrio Cholerae* o139 Bengal. *Diagn Microbiol Infect Dis*, 1995 Dec; 23(4):155-6
- 4) Uppal B, Berry N, Kakar S, Ramji S, Mathur MD. *Vibrio Cholerae* o1 Serotype Ogawa in a Neonate. *Diagn Microbiol Infect Dis*, 1999 Jan;33(1):63-4
- 5) Anna Lena Lopez. Cholera. Nelson's text book of Paediatrics, 19th edition; 3269-3274.
- 6) Khan AM, Faruque AS, Hossain MS. Isolation of *Vibrio cholerae* from neonates admitted to an urban diarrhoeal diseases hospital in Bangladesh. *Annals of Tropical Paediatrics*, 2005 Sept;25(3):179-184
- 7) Gordan MA, Walsh AL, Rogerson SR, Magomero Kc, Machili CE, Corkill JE; et al. Three cases of Bacteremia caused by *Vibrio Cholerae* O1 in Blantyre, Malawi. *Emerging Infectious Diseases* 2001 Nov-Dec;7(6): 1059-106

HPV Screening Challenges PAP Smear!

Ever since its introduction by Georges Papanicolaou, PAP stain has remained unchallenged as the screening procedure for cervical cancer. However, now there appears to be a contender in the form of HPV screening. In a new study published in *Lancet*, the researchers analysed the data from more than 175,000 women, aged 20 to 64, who had been followed for an average of six and a half years after having one of these screening tests. The protection offered by both methods appeared to be similar for the first two and a half years of follow-up. But after that, HPV screening provided 60-70% better protection than PAP smear. This protection was particularly noticeable in women between the ages of 30 and 35. Besides that, HPV screening done once in 5 years provided the best protection in contrast to PAP smear, which must be repeated every three years to get similar degree of protection. (*The Lancet*, news release, Nov. 2, 2013).

- Dr. K. Ramesh Rao