Is it time for neonates to be included in the cholera guidelines?

Neonatal cholera: a case series and rapid review of the literature

Background: In 2024-25 South Sudan experienced one of its largest cholera outbreaks. During the outbreak several neonates were admitted with suspected cholera to MSF managed and MSF co-managed Ministry of Health Facilities in Bentiu. The Global Taskforce on Cholera Control Guidelines only offer treatment guidelines from 2 months and up.

Case 1: A surgical presentation that later became a suspected cholera case

Day 1
- 20 day old neonate admitted via ER with history of fever and abdominal distension.
- Commenced on IV ampicillin and gentamicin for suspected sepsis

Day 2
- Increasing abdominal distension, firm abdomen with reduced bowel sounds
- Suspected ileus/possible necrotizing enterocolitis
- NG Tube placed made NPO and metronidazole added
- Marked bilious aspirates
- One episode of rice water stool and positive cholera RDT
- Grandmother who had been caring for baby had been treated in preceding days

Day 3
- Developed jaundice and increasing irritable
- Bilious aspirates increasing
- Blood film performed which showed malaria parasites (RDT on admission had been negative)
- Commenced on IV artesunate
- Diarrhoea continued

Day 4
- Discussion with paediatric advisor switched to cefotaxime and metronidazole
- Bilious aspirates continued and remained NPO

Day 5
- Improving slightly cautious feeding with EBM introduced but bilious aspirates and distension remained
- Potassium added to maintenance fluids as felt potentially hypokalaemia could be contributing to ileus

Day 9
- Despite bilious aspirates and slow progress mother was losing patience with not breastfeeding so decided to try and see with careful monitoring

Day 10
- Fully fed and antibiotics stopped

Day 11
- Discharged after 24 hours observation

Reviewed one week post discharge
- Breast feeding and gaining weight

Case 2: Neonates with suspected cholera can behave like they have sepsis with apnoeas

Day 1
- Admitted 7 days of age
- Febrile, hypoglycaemic and having frequent prolonged apnoeas required up to 2L of oxygen via nasal cannula.
- Mum had been admitted to cholera centre at time of birth
- Reports of rice water diarrhoea
- Received D10 bolus
- Commenced on IV Cefotaxime and Ampicillin and made NPO due to frequency of apnoeas 150ml/kg/day

Day 2
- Improving but ongoing rice water diarrhoea episodes
- Some apnoeas but mum commenced breast feeding the child as was not happy to leave NPO
- Cholera rapid diagnostic test positive

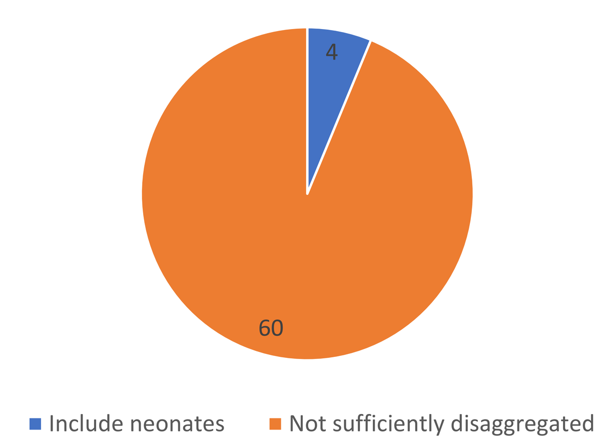
Day 5
- Diarrhoea fully resolved no further apnoeas and normal blood sugars
- Plan made to discharge next day after completion of antibitoics

Day 6
- Discharged after completing 5 days of antibiotics with advice to mum on safety netting and danger signs.
- Mum counselled on routine immunisation

A rapid review of the literature: limited evidence to guide treatment

Cholera is thought to be a rare phenomenon in neonates and more of a challenge in older children due to the protective effects of breastfeeding. We conducted a rapid review of the literature searching Pubmed and Web of Science. After screening 1056 titles and abstract and reviewing 15 full texts we were able to identify 12 complete case reports/ series with 13 cases , 4 epidemiological papers with 253 cases, one systematic review on managing cholera in children which did not specifically cover neonates, though it is important to note on antibiotic usage not all recommended antibiotics are considered safe in neonates. A number of cases of nontoxigenic vibrio cholerae invasive infections were also identified alongside this review but a literature review of invasive vibrio infections found very few cases in Africa.

Neonatal cases are not captured in epidemiological data



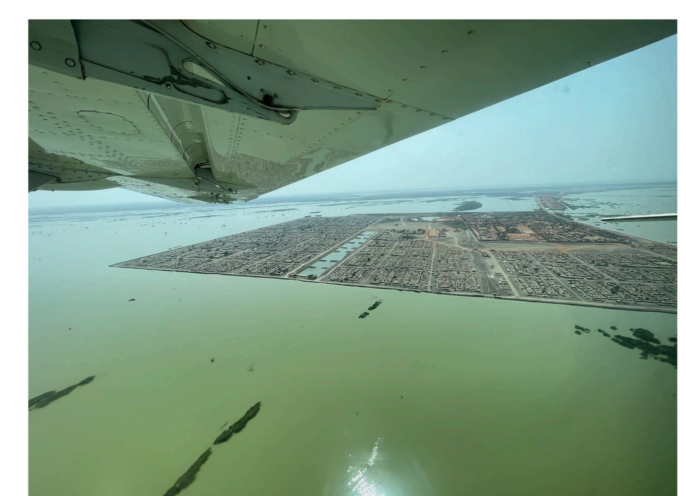
Most studies categorized by under 5 or under 1, with 2 studies specifically looking at epidemiology in neonatal units.

Several cases identified had vibrio bacteraemia on blood culture

Age	Country	Bacteraemia	Outcome	Year
4 days	Bangladesh	No	Survived	1995
2 days	India	No	Survived	1991
2 days	India	No	Survived	1999
1 day	India	Yes	Died	2000
3 days	India	*	*	2001
3 days	India	No	Survived	2016
3 days	Iran	Yes	Died	2007
2 days	Malawi	Yes	Died	2001
3 days	Mexico	Yes	Survived	2002
1 day	Pakistan	Yes	Died	2004
1 day	Pakistan	Yes	*	2005
6 days	South Africa	Yes	Died	1983
3 days	Thailand	No	Survived	1995

Invasive disease was associated with poor outcome but may explain why our patients behaved like they had sepsis. Treatment varied widely as did choice of antibiotic. The baby with invasive disease that survived received ICU care including inotropes.

Bentiu xPOC: a major site of the outbreak



Limitations: We were not able to confirm the cholera diagnosis in either neonate by PCR or culture due to the challenges of the outbreak. We do not have an accurate case fatality rate for neonatal cholera as data was not sufficiently age disaggregated, limited record keeping and failure to ask for consent from all cases. But across two neonatal units we were aware of 9 suspected cases with 2 fatalities. For the systematic review we sought to where possible only include serotype O1 & O139 cases, however some reports did not differentiate. An additional conference abstract from Lima, Peru referenced 6 cases however the full paper was not available.

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