Lancet. 2014 Jun 21;383(9935):2136-43. doi: 10.1016/S0140-6736(13)62630-6. Epub 2014 Mar 12.

Efficacy of a monovalent human-bovine (116E) rotavirus vaccine in Indian infants: a randomised, double-blind, placebo-controlled trial.

Bhandari N[1], Rongsen-Chandola T[1], Bavdekar A[2], John J[3], Antony K[4], Taneja S[1], Goyal N[1], Kawade A[2], Kang G[3], Rathore SS[1], Juvekar S[2], Muliyil J[3], Arya A[1], Shaikh H[2], Abraham V[3], Vrati S[5], Proschan M[6], Kohberger R[7], Thiry G[8], Glass R[6], Greenberg HB[9], Curlin G[6], Mohan K[10], Harshavardhan GV[10], Prasad S[10], Rao TS[11], Boslego J[12], Bhan MK[13]; India Rotavirus Vaccine Group.

Collaborators (33)

Ella KM, Mahesh M, Rafiqi FA, Dayma G, Pandit A, Bose A, Balraj V, More D, Ghatbandhe P, Kaur T, Basava S, Babji S, Mohindru A, Bagdwal M, Horigan E, Wecker M, Flores J, Alli D, Måseide K, Hirdman U, Strand T, Ananth BK, Santosham M, Fontaine O, Moulton L, Aneja S, Reed NZ, Bhatnagar V, Gupta AK, Kabra M, Ramji S, Sapru A, Moses P.

Author information

- [1]Centre for Health Research and Development, Society for Applied Studies, New Delhi, India.
- [2]KEM Hospital Research Centre, Pune, Maharashtra, India.
- [3]Christian Medical College, Vellore, Tamil Nadu, India.
- [4]PATH, New Delhi, India.
- [5]Translational Health Science and Technology Institute, Gurgaon, Haryana, India.
- [6]National Institutes of Health, Bethesda, MD, USA.
- [7]Blair & Co, Greenwich, CT, USA.
- [8]Advancing Rotavirus Vaccines Development Project, PATH, France.
- [9]Stanford University School of Medicine, USA.
- [10]Bharat Biotech International, Genome Valley, Andhra Pradesh, India.
- [11]Department of Biotechnology, Government of India, India.
- [12]Vaccine Development Global Program, PATH, USA.
- [13]Ministry of Science and Technology, Government of India, India. Electronic address: rajkbhan@gmail.com.

Abstract

BACKGROUND:

Rotavirus is the most common cause of severe dehydrating gastroenteritis in developing countries. Safe, effective, and affordable rotavirus vaccines are needed in these countries. We aimed to assess the efficacy and tolerability of a monovalent human-bovine rotavirus vaccine for severe rotavirus gastroenteritis in low-resource urban and rural settings in India.

METHODS:

We did a randomised double-blind, placebo-controlled, multicentre trial at three sites in Delhi (urban), Pune (rural), and Vellore (urban and rural) between March 11, 2011, and Nov 5, 2012. Infants aged 6-7 weeks were randomly assigned (2:1), via a central interactive voice or web response system with a block size of 12, to receive either three doses of oral human-bovine natural reassortant vaccine (116E) or placebo at ages 6-7 weeks, 10 weeks, and 14 weeks. Infants' families, study investigators, paediatricians in referral hospitals, laboratory staff, and committee members were all masked to treatment allocation. The primary outcome was incidence of severe rotavirus gastroenteritis (≥11 on the Vesikari scale). Efficacy outcomes and adverse events were ascertained through active surveillance. Analysis was by intention to treat and per protocol. The trial is registered with Clinical Trial Registry-India (CTRI/2010/091/000102 091/000102) and ClinicalTrials.gov (NCT01305109).

FINDINGS:

4532 infants were assigned to receive the 116E vaccine and 2267 to receive placebo, of whom 4354 (96%) and 2187 (96%) infants, respectively, were included in the primary per-protocol efficacy analysis. 71 events of severe rotavirus gastroenteritis were reported in 4752 person-years in infants in the vaccine group compared with 76 events in 2360 person-years in those in the placebo group; vaccine efficacy against severe rotavirus gastroenteritis was 53·6% (95% CI 35·0-66·9; p=0·0013) and 56·4% (36·6-70·1; p<0·0001) in the first year of life. The number of infants needed to be immunised to prevent one severe rotavirus gastroenteritis episode was 55 (95% CI 37-97). The incidence of severe rotavirus gastroenteritis per 100 person-years was 1·5 in the vaccine group and 3·2 in the placebo group, with an incidence rate ratio of 0·46 (95% CI 0·33-0·65). Prevalence of immediate, solicited, and serious adverse events was similar in both groups. One case of urticaria in the vaccine group and one each of acute gastroenteritis and suspected sepsis in the placebo group were regarded as related to the study product. We recorded six cases of intussusception in the vaccine group and two in the placebo group, all of which happened after the third dose. 25 (<1%) infants in the vaccine group and 17 (<1%) in the placebo group died; no death was regarded as related to the study product.

INTERPRETATION:

Monovalent human-bovine (116E) rotavirus vaccine is effective and well tolerated in Indian infants.

FUNDING:

Department of Biotechnology and the Biotechnology Industry Research Assistance Council, Government of India; Bill & Melinda Gates Foundation to PATH, USA; Research Council of Norway; UK Department for International Development; National Institutes of Health, Bethesda, USA; and Bharat Biotech International, Hyderabad, India.

Comment in

- 116E rotavirus vaccine development: a successful alliance. [Lancet. 2014]

PMID:

24629994

[PubMed - indexed for MEDLINE]

- Share on Twitter
- Share on Google+

Publication Types, MeSH Terms, Substances, Secondary Source ID

Publication Types

- Multicenter Study
- Randomized Controlled Trial
- Research Support, N.I.H., Extramural
- Research Support, Non-U.S. Gov't

MeSH Terms

- Double-Blind Method
- Female
- Gastroenteritis/prevention & control*
- Humans
- India
- Infant
- Male
- Rotavirus Infections/prevention & control*
- Rotavirus Vaccines/therapeutic use*

Substances

- Rotavirus Vaccines

Secondary Source ID

- ClinicalTrials.gov/NCT01305109

LinkOut - more resources