Evidence Update

Child Health Series

August 2003

Is reduced osmolarity oral rehydration solution better than the standard solution for children with diarrhoea and dehydration?

In children admitted to hospital with diarrhoea, reduced osmolarity ORS is associated with fewer unscheduled intravenous fluid infusions, lower stool volume, and less vomiting when compared to WHO standard ORS.

Inclusion criteria

Types of studies:

Randomized controlled trials, defined as a trial in which the subjects followed were assigned prospectively to one of two or more interventions by random allocation. This excludes quasi-randomized designs.

Types of participants:

Children with acute diarrhoea (history of less than 5 days).

Types of intervention:

Experimental: Reduced osmolarity oral rehydration solution (total osmolarity 250 mmol/L or less with reduced sodium).

Control: World Health Organization standard oral rehydration solution (90 mmol/L sodium, 111mmol/L glucose, total osmolarity 311 mmol/L).

Types of outcome measures:

Primary: need for unscheduled intravenous fluid infusion during the course of treatment.

Secondary: stool output; children vomiting during rehydration; and asymptomatic hyponatremia (defined as serum sodium less than 130mmol/L) during follow up.

Results

- Unscheduled intravenous fluid infusion was reported in 11 trials. Nine were adequately concealed.
- In a meta-analysis of 8 trials, reduced osmolarity ORS was associated with fewer unscheduled intravenous fluid infusions compared with WHO standard ORS (Mantel Haenzel odds ratio 0.59, 95% confidence interval 0.45 to 0.79) with no evidence for heterogeneity between trials.
- No unscheduled intravenous fluid infusion therapy was required in any participant in three trials.
- Eleven trials reported stool output, and data suggested less stool output in the reduced osmolarity ORS group.
- Vomiting was less frequent in the reduced osmolarity group in the six trials reporting this.
- Six trials sought hyponatraemia, with events in three studies, but no obvious difference between the two arms.





Adapted from Hahn S, Kim S, Garner P. Reduced osmolarity oral rehydration solution for treating dehydration caused by acute diarrhoea in children (Cochrane Review). In: *The Cochrane Library*, Issue 3, 2003. Oxford: Update Software.

Produced by the Effective Health Care Alliance Programme, Liverpool School of Tropical Medicine, supported by the Department of International Development UK, (http://www.liv.ac.uk/evidence).

Reduced osmolarity oral rehydration solution for treating dehydration caused by acute diarrhoea in children Review: Comparison: 01 Reduced osmolarity ORS compared to WHO standard ORS 01 Need for unscheduled intravenous fluid infusion Outcome:

Study	Treatment n/N	Control n/N	Odds Ratio (Fixed) 95% Cl	Weight (%)	Odds Ratio (Fixed) 95% Cl
Bangladesh 1995a	4/19	5/19		3.1	0.75 [0.17, 3.36]
K Bangladesh 1996a	0/18	0/18		0.0	Not estimable
CHOICE 2001	34/341	50/334		35.6	0.63 [0.40, 1.00]
Colombia 2000	7/71	16/69		11.5	0.36 [0.14, 0.95]
Egypt 1996b	1/94	8/96		6.1	0.12 [0.01, 0.97]
k India 1984a	0/22	0/22		0.0	Not estimable
India 2000b	11/88	12/82		8.5	0.83 [0.35, 2.01]
Mexico 1990a	2/82	7/84	• • •	5.3	0.28 [0.06, 1.37]
Panama 1982	0/33	0/30	_	0.0	Not estimable
USA 1982	0/15	1/20	•	1.0	0.42 [0.02, 11.03]
WHO 1995	33/221	43/218	-	28.9	0.71 [0.43, 1.18]
Fotal (95% CI) Fest for heterogeneity chi-sq Fest for overall effect=-3.64	92 / 1004 uare=5.47 df =7 p=0.6 p=0.0003	142/992 025	•	100.0	0.59 [0.45, 0.79]
			.01 .1 1 1	10 100	
			Favours treatment Favours	control	

Reviewer's conclusions

Implications for practice:

Based on this review WHO and UNICEF now recommend reduced osmolarity ORS (total osmolarity 250 mmol/L or less with reduced sodium) be adopted as standard in primary care.

Implications for research:

We found insufficient data on cholera in children to make recommendations for this condition.

The Cochrane Library is the main output of the Cochrane Collaboration, is updated quarterly, and available on subscription via the Internet or on CD-Rom. Subscription details from http://www.cochrane.org or http://www.wiley.com. Developing countries can access evidence-based material from http://www.healthinternetwork.org