Reviewer's report

Title: Oral rehydration versus intravenous therapy for treating dehydration due to gastroenteritis in children: a meta-analysis of randomised controlled trials

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Reviewer: Olivier Fontaine

Reviewer's report:

General
This article is presenting the results of a very well designed and conducted meta-analysis of randomized clinical trials (RCT) comparing the efficacy/safety of oral rehydration therapy (ORT) with that of intravenous fluid therapy (IVT) in children with acute diarrhoea. The authors should be congratulated for their remarkable work, and especially for their efforts to identify all RCT that have addressed this important issue.

Overall, this meta-analysis is confirming, very elegantly, the results of previous meta-analyses on the topic, by showing that there is "clinically no important differences between ORT and IVT in terms of efficacy and safety". The authors should also be congratulated for their very correct and courageous conclusion that with the clear demonstration of the efficacy/safety of ORT when compared to IVT, further RCT on this topic should be considered unethical to perform.

Discretionary Revisions (which the author can choose to ignore)
It would have been interesting to describe the composition of the different ORT solutions and IVT solutions used in these studies. I doubt that the same solutions were used in all the studies. In fact I know that one of the study (30)was conducted to compare the efficacy of a low osmolarity ORS solution with that of the standard ORS solution and that of IVT. If other reduced osmolarity ORS solutions were used it would be of interest to compare the efficacy/safety of this group of ORS solutions with that of standard ORS solution and that of IVT.

Minor Compulsory Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)
Just some minor additional information concerning the study mentioned in reference 30:

the study was supported by funds from the Department for the Control of Diarrhoeal Diseases (CDD) of the World Health Organization (WHO). The randomization list was developed in WHO using tables of random permutations of 16 numbers. Treatment allocations corresponding to the randomization list were inserted in serially numbered enveloppes. Patient 001 received treatment contained in enveloppes serially numbered 001, and so on.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

This meta-analysis is also confirming a clinical observation that "for every 25 children treated with ORT, one would fail and require IVT". This percentage of treatment "failure" with ORT is very close to what is observed outside of research projects. In the document entitled "The treatment of Diarrhoea (WHO/CDR/953), it is said that "in about 5% of children the signs of dehydration do not improve during ORT, or worsen after initial improvement... Such children should be given ORS by
naso-gastric tube, or should be treated with IVT."

However, this percentage of treatment "failure" was observed/calculated when using the standard ORS solution containing 90 mmol/l of sodium and 111 mmol/l of glucose for a total osmolarity of 311 mOsmol/l. Recently, the meta-analysis conducted by Hahn et al (ref 42) on reduced osmolarity ORS solutions (total osmoalrity of about 245 mOsmol/l) showed that this percentage of treatment "failure", defined as the proportion of patients requiring IVT after having started treatment with ORT, could be very significantly reduced by 33%. This new reduced (low) osmolarity ORS solution, that is more efficacious that the ORS solutions used in the articles reviewed in the meta-analysis, is now the ORS formulation recommended by WHO and UNICEF. I feel this should be mentioned in the Discussion section of the article.

What next?: Accept after discretionary revisions

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No

Declaration of competing interests:

None