

FORMULATION AND EVALUATION OF ORAL REHYDRATION SALT**Mr. Nagargoje Pradeep Kalyan*¹, Dr. Santosh. Jain*², Prof. D.M. Waghmode*³***¹Student, Dr. Babasaheb Ambedkar Technological University, India.*²Principal, Dr. Babasaheb Ambedkar Technological University, India.*³Assistant Professor Dr. Babasaheb Ambedkar Technological University, India.**ABSTRACT**

Reviewed are all the published clinical trials of glycine-based oral rehydration salts (ORS). L- alanine-based ORS, L-glutamine-based ORS, maltodextrin-based ORS, and rice-based ORS, as well as the results of several recently completed, but unpublished, studies of these formulations that were supported by WHO. All experimental ORS formulations contained the same concentrations of salts as citrate-based WHO-ORS; all trials were randomized comparisons with WHO-ORS, and all except those with rice-based ORS were double-blind studies. The rate of stool loss and, less frequently, the duration of diarrhoea were used as indicators of clinical performance to compare ORS formulations. The following conclusions were reached concerning the efficacy and use of modified ORS formulations. Rice-based ORS (50 g/l) is superior to WHO-ORS for patients with cholera, and for such patients it can be recommended in any situation where its preparation and use are practical. Rice-based (50 g/l) and WHO-ORS solutions are equally effective for treating children with acute non-cholera diarrhoea, when feeding is resumed promptly following initial rehydration, as has been consistently recommended by WHO. Since rice-based ORS is not superior to WHO-ORS for such children, there is no apparent reason to advise a change from glucose to pre-cooked rice in the recommended formulation for WHO-ORS. Maltodextrin-based ORS formulations (50 g/l) and WHO-ORS appear to be equally effective for treating children with acute non-cholera diarrhoea, there is no reason to advise a change from glucose to maltodextrin in the recommended formulation for WHO-ORS. Amino-acid-containing ORS formulations are not recommended for either non-cholera or cholera diarrhoea, since they are more costly and have no clinical advantage over WHO-ORS for children with acute non- cholera diarrhoea or over rice-based ORS for persons with cholera.

Keywords: L-Glutamine-Based ORS, Maltodextrin-Based ORS L-Alanine-Based ORS.**I. INTRODUCTION**

ORS Powder is a compound powder (containing more than one ingredient) for internal use for diarrhoea & rehydration. ORS is a special combination of dry salts that is mixed with safe water. It can help replace the fluids lost due to diarrhoea.

Oral rehydration solution (ORS) is an oral powder-containing mixture of glucose sodium chloride, potassium chloride, and sodium citrate.

Oral rehydration salts (ORS) are a mixture of electrolytes (salts) and carbohydrates (in the form of sugar) dissolved in water. They are used to replace salts and water that the body loses when you have dehydration caused by gastroenteritis, diarrhoea or vomiting.

Oral rehydration therapy is a treatment for dehydration. It involves drinking a beverage made of water, sugar, and electrolytes, specifically potassium and sodium. The beverage is called an oral rehydration solution (ORS). The goal of oral rehydration therapy is to replenish the body's fluid levels. Certain types of salts (sodium, chloride, potassium) are needed by your body for many processes, eg, to regulate water in and around cells, for brain function, to aid digestion and to regulate blood pressure. So it is important to replace them if you have become dehydrated. Oral Rehydration Salts (ORS) is the non-proprietary name for a balanced glucose-electrolyte mixture, first used in 1969 and approved, recommended, and distributed by UNICEF and WHO as a drug for the treatment of clinical dehydration throughout the world.

Oral rehydration salts (ORS) are a mixture of electrolytes (salts) and carbohydrates (in the form of sugar) dissolved in water. They are used to replace salts and water that the body loses when you have dehydration caused by gastroenteritis, diarrhoea or vomiting. Unlike other fluids you might drink to replace what you have lost, the proportion of salts and sugar in an ORS matches what your body needs to recover.

Commercially-available ORS products like drinks, ice blocks, sachets or effervescent tablets for making solutions can be bought from pharmacies. They are often available in different flavours.

Home-made salt/sugar mixtures are used in developing countries if rehydration drinks are not available, but they have to be made carefully as too much salt can be dangerous. ORS Day is celebrated every year on 29th July to highlight the importance of Oral Rehydration Salts (ORS) as a cost-effective way of fighting against deadly disease.

Important tips:

You should not use oral rehydration salts to treat diarrhoea for more than 2–3 days unless your doctor has told you to.

You should only use water to mix with the oral rehydration salts; do not use milk or juice and never add extra sugar or salt. This is because the rehydration salts contain the right mix of sugar and salts to help the body best.

You must be careful to use the right amount of water to make up the medicine, as too much or too little can mean the salts in your child’s body are not properly balanced.

Oral rehydration salts are safe and do not usually have side effects. You can take other medicines at the same time as oral rehydration salts. Avoid fizzy drinks, undiluted juices, tea, coffee and sports drinks because their high sugar content can make you more dehydrated.



II. MATERIAL

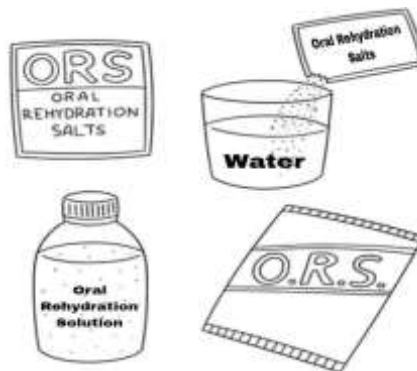


Table 1:

Ingredients	Quantity (g)
Sodium Chloride	2.6g
Potassium Chloride	1.5g
Sodium Citrate	2.9g
Dextrose	13.5g

Table 2:

WHO-ORS	mOsmol/L
Sodium	75
Chloride	65
Glucose,anhydrous	75

Potassium	20
Citrate	10
Total Osmolarity	245

III. METHODS



Sodium Chloride (NaCl)



Potassium Chloride (KCL)



Dextrose (C6H14O7)



Sodium Citrate (Na3C6H5O7)

Sodium Chloride 2.6 gm + Potassium Chloride 1.5 gm + Sodium Citrate 2.9 gm + Dextrose 13.5 gm
 Mix all these ingredient

Oral Rehydration Therapy Safe For Children ?



Oral rehydration therapy is safe for children. It's commonly used to treat diarrhea- related dehydration in children.

Compared to adults, children are more likely to experience dehydration due to diarrhea. They have a higher metabolic rate, meaning their bodies quickly use water. Children might also be unable to recognize thirst or hydrate themselves.

Factors like burns, excessive sweating, or low water intake can further increase the risk of dehydration.

Oral rehydration therapy might also be used for older people and those with medical conditions. Like children, these individuals have a higher risk of developing dehydration.(#)

Generally, healthy adults with mild diarrhea can also drink ORS, but it might be unnecessary. They can usually rehydrate with water, clear broths, or sports drinks that contain electrolytes.

Uses

This product is used to replace fluids and minerals (such as sodium, potassium) lost due to diarrhea and vomiting. It helps prevent or treat the dehydration. Having the right amount of fluids and minerals is important for the normal functioning of the body.

IV. SIDE EFFECTS

Mild nausea and vomiting may occur. These effects can be decreased by taking this product slowly in small amounts with a spoon. If any of these effects last or get worse, contact your doctor or pharmacist promptly.

Potential risks and side effects of oral rehydration therapy

Oral rehydration therapy is designed to normalize electrolyte levels. However, if the solution isn't prepared or used correctly, it can cause salt toxicity. This is also known as hypernatremia.

Possible side effects include:

Nausea



A feeling of sickness or discomfort in the stomach that may come with an urge to vomit.

Vomiting



Vomiting is the body's way of getting rid of harmful substance from the stomach, or it may be a reaction to something that has irritated the gut.

Weakness



Weakness is a lack of physical or muscle strength.

Loss of appetite



A loss of appetite occurs when you don't feel hungry or have the desire to eat food.

Confusion



Confusion is the inability to think as clearly or quickly as you normally do.

Severe thirst



The urge to drink too much may be the result of a physical or emotional disease.

Kidney damage



That can cause swelling in your ankles, nausea, weakness, poor sleep, and shortness of breath.

Warnings & Precautions

Before taking this product, tell your doctor or pharmacist if you are allergic to it; or if you have any other allergies. This product may contain inactive ingredients, which can cause allergic reactions or other problems. Talk to your pharmacist for more details.

Infants under the age of 2 years with severe diarrhoea/vomiting should be seen by a doctor as soon as possible.

If symptoms persist for longer than 24-48 hours, a doctor should be consulted.

The solution must be made up without adding extra sugar or salt. In treating diabetics with gastro-enteritis, the sugar content must be noted.

Solutions of greater concentration may result in hypernatraemia. Those of greater dilution may result in inadequate replacement.

Oral rehydration solution work



ORS works because sodium, and therefore water, absorption in the small intestine is increased by glucose (sugar). The two are carried across the wall of the small intestine together via a mechanism called "the sodium-glucose cotransport mechanism". The toxins which cause diarrheal diseases, such as from food poisoning, increase secretion of water into the small intestine, but don't block water uptake by this sodium-glucose transport mechanism. So ORS doesn't cure you if you're using it when you have diarrhea, but it will rehydrate you.

Dosage

Depending upon age and severity of dehydration.

Infants and Children : 1-2 litres (5-10 glasses) over a period of 24 hours. Adults : 2-4 litres (10-20 glasses) over a period of 24 hours.

Continue treatment until diarrhoea stops / dehydration is corrected.

Caution

Use with caution in impaired renal function or intestinal obstruction. Solution to be used within 24 hours.

Discard the unused solution.

Storage: Store in a cool and dry place.

Store protected from moisture.

Labelling Directions: Dissolve the contents of the packet in 1litre of freshly boiled and cooled water.

Shelf-Life: Sachet of 21.8g -24 Months

Overdose: In oral electrolyte replacement therapy, toxicity is rare in previously healthy people. In subjects with renal impairment, hypernatraemia and hyperkalaemia might occur.

In the event of significant overdose serum electrolytes should be evaluated by means of full biochemical profile under hospital conditions and the physician should take the appropriate measures. This is particularly important in the very young and in cases of severe hepatic or renal failure.

V. ORS BENEFITS

Here is all we need to know about ORS benefits for health.



1. Improved energy levels

ORS (Oral Rehydration Solutions) has been consistently known and trusted to provide sustainable energy when feeling fatigued. ORS Benefits are countless, as ORS helps to restore valuable electrolytes, carbohydrates, and fluids which are essential in boosting our energy levels. ORS isn't just useful during dehydration or physical strain; ORS may also be taken as a dietary supplement on a regular basis as a proactive measure to maintain healthy energy levels.

Furthermore, ORS is not only designed for adults but can be fine-tuned for young children who require more micronutrients like zinc and potassium for proper growth and development. ORS nourishes bodies with the essential elements needed to replace lost energy throughout the day and allows them to stay active longer.

2. Good for Dehydration



It is important to stay hydrated, particularly during the summer months. ORS (oral rehydration solution) is a great solution for this! ORS offers many benefits including restoring lost electrolytes, providing necessary glucose and proteins, and maintaining adequate hydration levels. ORS is also very cost effective and can be created easily with salt, clean water, sugar, and a pinch of baking soda. With ORS you can confidently remain properly hydrated all summer long.

3. Fights Diarrhoea



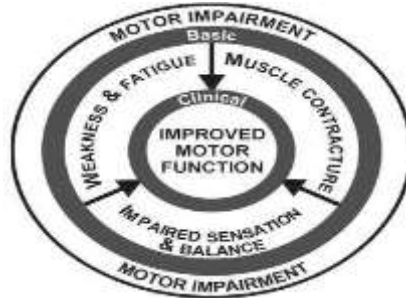
Suffering from diarrhea can be an unpleasant experience, leaving one feeling weak and dehydrated. ORS (oral re-hydration solution) is an effective way to fight it by replenishing the body with essential minerals, salts, and sugars that are lost due to dehydration.

ORS provides a faster source of energy than many other methods, while also preventing electrolyte imbalances in the body. It is also beneficial for those with food poisoning or who have contracted bacterial or viral infections since ORS benefits go beyond being just a simple drink. ORS helps return water and electrolytes lost during acute diarrhea so that you feel restored and energized as soon as possible!

4. Improved Focus and Motor Function

ORS Benefits are well-known for its ability to improve focus and motor function. This is due to ORS being an advanced neuromodulation system that targets specific sets of nerve cells, stimulating them and allowing the body to better communicate with these neurons.

ORS can therefore help with enhancing focus and improving motor function in patients who suffer from neurological problems. ORS makes use of special electrodes that target the neurons responsible for movement, coordination, and cognitive functioning; hence giving ORS the ability to offer such beneficial outcomes with improved focus and motor functioning!



5. ORS uses for weakness



ORS (oral rehydration solution) has a myriad of benefits for people who are feeling weak. ORS can help to quickly restore lost electrolytes and minerals to prevent dehydration, which can often cause **fatigue** and weakness. Aside from physical strength, ORS is also effective in improving mental clarity as consuming ORS restores both electrolytes and glucose levels which provide energy that help speed up cognitive performance.

In addition, ORS can provide emotional refreshment from feeling tired or weak due to difficult circumstances or challenging situations. Therefore ORS is an effective solution for both physical and mental weakness due to its ability to replace minerals, increase energy levels and recharge tired minds.



6. ORS benefits for skin

ORS, or Oral Rehydration Salts, offers both immediate and long term benefits to the skin. ORS can help repair minor facial damage due to sun exposure, windburn, and other stressors that cause rashes. ORS works to visibly restore damaged skin cells, reduce inflammation and puffiness, as well as hydrate dry patches of skin. ORS users often report a smoother, softer appearance on their face within a few days of use.

ORS is also known for its ability to lock in moisture and soothe sensitive areas of the body like the hands and feet. ORS has no known side effects or interactions with topical skin care products making it an ideal option for those seeking quick relief from their skin woes without added risk.



7. Other ORS benefits:

ORS is an oral rehydration solution widely used to help prevent and treat dehydration in children, especially those suffering from gastroenteritis or diarrhoea. ORS consists of a mixture of electrolytes, carbohydrates, and other substances that helps to restore fluid balance in the body. ORS has been show to reduce complications associated with diarrhoea and helps to promote faster recovery.

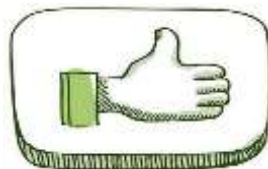
ORS benefits extend into other areas too - ORS can also help decrease hospital admissions due to dehydration as well as shorten the duration of diarrhoea related illness. It is recommended that ORS be administered along with zinc supplements as well as continued breastfeeding if possible. ORS makes it easier for families to keep their young ones from becoming severely dehydrated, providing essential hydration support during times of illness or stress.

8. ORS benefits for pregnancy



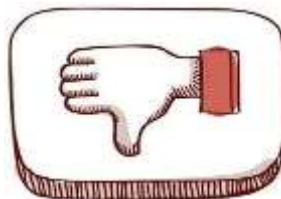
ORS Benefits are available to expecting mothers as part of the ORS program. ORS is an acronym for Old-Age, Survivors, and Disability Insurance, and it provides necessary support during pregnancy. ORS Benefits include aid with healthcare, cover medical expenses, help with long-term care after birth, and can even provide financial security should a mother not be able to work due to her pregnancy. ORS benefits have been designed to ensure expectant mothers have access to essential resources that can help them make the best possible health decisions for themselves and their newborn baby.

VI. ADVANTAGES OF ORS



1. Increased efficacy of ORS in non-cholera diarrhoea.
2. Need for unscheduled supplement IV therapy in children fell by 33%.
3. Stool output decreased by 20%.
4. Vomiting decreased by 30%.
5. Safe & effective.

VII. DISADVANTAGES OF ORS



1. Less stable.
2. Stool output not reduced.
3. The reduced omolarity ORS has been criticized by some for not providing enough sodium for adults with cholera. Clinical trials have, however, shoen reduced osmolarity ORS to be both safe and effective for adults and children with cholera.

VIII. RESULT

In our opinion, the development of new ORS formulations Could help to overcome these disadvantages. The main difficulty, The salty taste, can be masked using flavors, reconstituting And administering the product at low temperatures or using Pleasant textures that can resemble desserts or sweets.

IX. CONCLUSION

Currently, in the management of acute diarrhea, particularly In children, there is still a need to improve the acceptability And adherence to ORS, for example palatability, swallowability, Appearance or parent's attitude towards the treatment Administration.

Another important critical point in the oral rehydration is The volume administered, which children usually do not accept. In gel formulations the volume is significantly reduced to around 100ml, and can be administered at small portions, thus avoiding Its refusal and facilitating the role of parents or caregivers in Administering it. Recent comparative studies are demonstrating. These benefits, together with the demonstration of the electrolytes Release at gastric level.

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