

## ORIGINAL ARTICLE

**Compliance of zinc supplementation by care givers of children suffering from diarrhea**

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**Abstract**

**Background:** Over 2 million children die as a result of diarrhea and dehydration every year. A new ORS formula and introduction of Zinc supplementation offers much improved outcomes for the treatment of childhood diarrhea. **Aims:** To assess the compliance of Zinc supplementation by caregivers **Objectives:** 1. To assess the compliance of Zinc supplementation by caregivers, 2. To find out the reason for non-compliance 3. To study the association of socio-demographic variables and non-compliance of children suffering from diarrhea **Materials & Method:** Study Design: Cross-sectional survey Study Period: from 1st Sept. 2014 to 31st Oct. 2014 Study Area: Pediatric Outpatient department of Tertiary Care Hospital Inclusion Criteria: Under five children suffering from diarrhea attending Pediatric OPD Study Tool: Questionnaire was administered to care givers and follow up was done on 3rd, 7th & 14th day of Zinc supplementation. **Result:** 84% of non-compliance was seen in this study. **Conclusion:** The compliance of Zinc supplementation is poor among caretakers of children suffering from diarrhea.

**Key Words:**

Compliance; Zinc supplementation; Children; Diarrhea

**Introduction**

Zinc stores in the body are known to be depleted during acute diarrhea.(1) Zinc treatment is now recommended by the World Health Organization as part of the routine management of acute childhood diarrhea. Only limited information is available on the acceptability and adherence to zinc tablet. No study has formally assessed whether the formulation is acceptable to children and if caretakers can adhere to the instructions.(2) The Government of India in 2006 issued guidelines for zinc supplementation along with ORS for managing diarrhea in children aged 2 months to 5 years.(1)

However, even after 8 years since these guidelines were issued, use of zinc remains abysmally low in most of the states.

Diarrhea with severe zinc (Zn) deficiency has been observed in children in developing countries. These findings prompted studies of Zinc supplementation

in children with diarrhea. Thus, there is a compelling body of clinical data that Zn is likely to be effective both in the treatment of acute diarrhea and in its prophylaxis.(1)

The results of studies on zinc treatment as an adjunct in acute diarrhea have been reviewed in many studies.

Despite of this, the 14 day regimen of Zinc supplementation becomes a non-acceptable to the caregivers of children suffering from diarrhea.

**Aims & Objectives**

1. To find out the compliance of Zinc supplementation
2. The reason for non-compliance.
3. To study the association of socio-demographic variables and non-compliance of children suffering from diarrhea

**Material and Methods**

A Cross-sectional study was conducted in the Tertiary Care Hospital from 1st September 2014 to 31st October 2014 in the Pediatric Outpatient Department.

Under five children suffering from diarrhea attending Pediatric OPD were included in the study after pediatric consultation is done.

Before the administration of study tool, the caretakers consented for participation was included in the study. Prescriptions of these children were examined and the caretakers of these children whose been prescribed with Zinc supplementation along with ORS and other medications were interviewed with semi-structured questionnaire.

Their telephone number with other contact number was taken to do the follow up. Then, the follow up calls were made on given telephone number on 3rd, 7th & 14th day zinc supplementation. Enquiries about adherence to the zinc supplementation were made. Information on reasons of non-adherence to Zinc supplementation was also obtained.

The analysis of collected data was started on 14<sup>th</sup> November 2014 to obtain complete follow up of caretakers.

Informed consent was taken from caretakers of children suffering from diarrhea and study was approved by Institutional Ethical Committee.

## Results

Total 136 children came for consultation. Of which, 10 were admitted to wards and 6 were refused to participate in the study. So, total 122 under five children suffering from diarrhea were surveyed. Information was obtained from their caretakers. Of 122 children, 99% of the caretakers were mother.

The data on continuation of Zinc supplementation till 14th day of Zinc supplementation was collected.

Similarly, data on Mother's education, Mother's occupation, Fathers education, Fathers occupation, Socio-economic status by Modified B G Prasad's classification, Type of family, Birth order of affected child, Vaccination status and past 6 months history of similar episode was collected. Information on rotavirus vaccination was also obtained. (Table 1)

51% children were in the age group of 1 to 3 years. Here, infant below 6 months of age were not included to avoid the effect of exclusively breast feeding. 55% mothers were illiterate and maximum women were housewives. 67% fathers were literate and maximum fathers were engaged in semi-skilled work. 53% children were from nuclear family

whereas 80% of them were Hindu. 57% children were of birth order of more than 2. 71% children were completely vaccinated as per their age. The data on rotavirus vaccination status shows that only 10% of children were vaccinated with rotavirus vaccination.

The Table 2 shows that when the follow up was done on 3rd day of Zinc supplementation, the total of 102 caretakers were reachable on phone as the 20 caretakers had given a wrong telephone numbers. Of this, 102 caretakers, 98% of them were adhered to Zinc medication. When the follow up calls was done on 7th day of those who did not stop taking Zinc supplementation, 82% of them had stopped taking Zinc supplementation even if they were informed about 14 day regimen of Zinc.

In the table 3, the attempt to find out the reason for non-compliance was done. Here, information was obtained from those caretakers who did not stick to the 14 day regimen. The most common (78%) reason for non-compliance was "Children became symptom free" followed by "consultation with other pediatrics".

In the table 4, attempt has been made to find out the association between certain socio-demographic variables and compliance of Zinc regimen. With the application of Chi-square statistical test, the study showed that there is significant association between compliance of Zinc and Variables like Mother's Education, Mother's Occupation, Father's Education, Father's Occupation, Type of family and birth order of child.

Data on Past history of diarrhea within 6 months were also collected. 86% (105 out of 122) of children had suffered from similar diarrheal illness in the past 6 month. When the enquiries about Zinc supplementation during last episode were enquired, it revealed that out of 105 children who suffered in the past, 35 were prescribed with Zinc supplementation.

## Discussion

Very few studies on compliance of Zinc supplementation are available in India. Despite of its introduction in the management of Diarrhea and its effectiveness, the compliance of Zinc supplementation is poor. The studies which are available in India and other developing countries shows the Randomized controlled trials showing effectiveness of 14 day regimen of Zinc to various other rescheduled days of regimen. (3,4) Similarly

there are studies conducted on prescribing pattern of Zinc and use of Zinc supplementation by health care professionals (5, 6). But, these studies are not from India. The study conducted in rural Bangladesh showed the adherence to full regimen of Zinc is seen in 62% of children (7). Another study from Bangladesh also revealed that the adherence to full regimen of Zinc is seen in 55.8% of caretakers (8).

### Conclusion

This study concludes that 84% care takers were not adhered to the Zinc supplementation till the recommended 14 day regimen of Zinc and the most common reason was “children became symptom free” and there is significant association between compliance of Zinc and Variables like Mother’s Education, Mother’s Occupation, Father’s Education, Father’s Occupation, Type of family and birth order of child.

### Recommendation

Zinc supplementation along with ORS is an example of Appropriate Technology. Thorough counseling of Caretakers to obtain the compliance of zinc is needed to avoid the morbidity & mortality associated with Diarrhea.

There is a need of such type of studies to assess the poor compliance of zinc supplementation in India.

Also, there is need of studies which shows the knowledge and use of Zinc supplementation among health professionals, prescribing pattern of Zinc supplementation by doctors.

There is a need to review the duration of Zinc supplementation by controlled trials

### Limitation of the study

This study was conducted in a hospital setting and has a comparatively small sample. Also, the follow up was done on telephone.

### Relevance of the study

The study is relevant as very few data is available on compliance of Zinc supplementation and is shows

that importance of Zinc supplementation must be extensively stress onto the caretakers.

### Authors Contribution

VSS: Concepts, Design, Literature search, Data acquisition, Data analysis, Statistical analysis, Manuscript preparation, Guarantor. FK: Concepts, Design, Literature search, Manuscript preparation, Guarantor. CPS: Data analysis, Statistical analysis, Manuscript preparation. PHT: Statistical analysis, Manuscript editing, Manuscript review.

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### References

1. Zinc Supplementation for the Treatment of Diarrhea Moving from Research to Practice. [www.Zinc\\_advocacy\\_USAID.pdf](http://www.Zinc_advocacy_USAID.pdf) assessed on 29 octo 2014
2. Davendra KT, Akash M: Zinc: An Effective but Neglected Child Survival Intervention. *Indian Journal of Community Medicine* 2014, 39(4):191-93
3. Muhammad AH, Sajid S, Kamran S, Tariq S, Musawar H, Mushtaq M et al: A study to evaluate the acceptability, feasibility and impact of packaged interventions (“Diarrhea Pack”) for prevention and treatment of childhood diarrhea in rural Pakistan. *BMC Public Health* 2013, 13:922
4. Archana P, Michael JD, Manju M, Neetu B, Hemant K: Zinc and copper supplementation in acute diarrhea in children: a double-blind randomized controlled trial. *BMC Medicine* 2009, 7:22
5. Vivian OO, Ifeanyi JO, Itse CK: Knowledge and Use of Zinc Supplementation in the Management of Childhood Diarrhoea among Health Care Workers in Public Primary Health Facilities in Benin-City, Nigeria. *Global Journal of Health Science* 2012, 4(2):68-76
6. Esezobor CI, Adeniyi OF, Ekure EN: Knowledge, Acceptance and Practice of Zinc Therapy in Acute Diarrhoea Among Paediatric Doctors in Nigeria. *Nigerian Journal of Paediatrics* 2011;38 (4)159 – 164
7. Shahnawaz A, Dilruba N, Farzana F, Fahmida D F, Guddu K, Mohammad J C: Acceptability and Compliance to a 10-Day Regimen of Zinc Treatment in Diarrhea in Rural Bangladesh. *Food and Nutrition Sciences*, 2013, 4, 357-364
8. Dilruba N, Charles P. L, Samina S, and Toslim U. K: Acceptability of and Adherence to Dispersible Zinc Tablet in the Treatment of Acute Childhood Diarrhoea. *Journal of Health Population and Nutrition* 2005 Sep;23(3):215-221

## Tables

**TABLE 1 SOCIO-DEMOGRAPHIC DATA OF CHILDREN SUFFERING FROM DIARRHEA (N=122)**

Socio-demographic Variables	Socio-demographic Variables	Total (%)
Age	Infant (6months to 12months)	44 (36%)
	1 – 3years	62 (51%)
	3 -5 years	16 (13%)
Gender	Male	76 (62%)
	Female	46 (38%)
Socio-Economic Status	Class I	3 (3%)
	Class II	15 (12%)
	Class III	45 (37%)
	Class IV	50 (41%)
	Class V	9 (7%)
Mother's Education	Literate	55 (45%)
	Illiterate	67 (55%)
Mother's Occupation	Housewife	53 (43%)
	Laborer	43 (35%)
	Service	26 (21%)
Father's Education	Literate	82 (67%)
	Illiterate	40 (33%)
Father's Occupation	Professional	10 (8%)
	Clerical	25 (21%)
	Skilled	18 (15%)
	Semi-Skilled	38 (31%)
	Unskilled	31 (25%)
Religion	Hindu	98 (80%)
	Others	24 (20%)
Type of Family	Nuclear	64 (53%)
	Joint	30 (25%)
	Three generation	28 (22%)
Birth order of child	1st order child	15 (12%)
	2nd order child	38 (31%)
	More than 2nd order child	69 (57%)
Vaccination status (as per the age of child)	Completely vaccinated	86 (71%)
	Incompletely vaccinated	36 (29%)
Rotavirus Vaccination status	Given	12 (10%)
	Not given	90 (74%)
	Not known	20 (16%)

**TABLE 2 COMPLIANCE OF ZINC SUPPLEMENTATION**

Follow up visit	Stopped Zinc Medication	Not stopped Zinc Medication
3rd day (n = 102*)	2 (2%)	100 (98%)
7th day (n = 100)	82 (82%)	18 (18%)
14th day( n = 18)	18 (100%)	-

**TABLE 3 REASON FOR NON- COMPLIANCE**

Reasons	Frequency (n = 84)
Children became symptom free	66 (78%)
Children were taken to other Pediatrician	8 (9%)
Stopped on their own	6 (7%)
Children were admitted to other hospital	2 (3%)
Children were taken to other Specialist	2 (3%)

**TABLE 4 ASSOCIATION OF SOCIO-DEMOGRAPHIC VARIABLES WITH COMPLIANCE TO ZINC REGIMEN (N = 102)**

Socio-demographic Variables	Socio-demographic Variables	Non-Compliance (n = 84)	Compliance (n = 18)	Chi Square Value (d.f)	P Value
<b>Age</b>	Infant (6months to 12months)	26 (31%)	6 (34%)	4.2 (2)	<b>0.12</b>
	1 – 3years	52 (62%)	8 (44%)		
	3 -5 years	6 (7%)	4 (22%)		
<b>Gender</b>	Male	56 (67%)	14 (78%)	0.41 (1)	<b>0.52</b>
	Female	28 (33%)	4 (22%)		
<b>Socio-Economic Status</b>	Class I	2 (2%)	0	5.55 (3)	<b>0.18</b>
	Class II	8 (9%)	2 (11%)		
	Class III	28 (34%)	11 (61%)		
	Class IV	42 (50%)	4 (22%)		
	Class V	4 (5%)	1 (6%)		
<b>Mother's Education</b>	Literate	28 (33%)	15 (84%)	13.2 (1)	<b>&lt;0.001</b>
	Illiterate	56 (67%)	3 (16%)		
<b>Mother's Occupation</b>	Housewife	43 (51%)	2 (11%)	10.479 (2)	<b>0.005</b>
	Laborer	21 (25%)	10 (56%)		
	Service	20 (24%)	6 (34%)		
<b>Father's Education</b>	Literate	58 (69%)	12 (67%)	0.007 (1)	<b>0.007</b>
	Illiterate	26 (31%)	6 (34%)		
<b>Father's Occupation</b>	Professional	2 (2%)	6 (34%)	23.899 (4)	<b>&lt;0.001</b>
	Clerical	20 (24%)	3 (16%)		
	Skilled	8 (9%)	4 (22%)		
	Semi-Skilled	34 (41%)	3 (16%)		
	Unskilled	20 (24%)	2 (11%)		
<b>Religion</b>	Hindu	76 (91%)	14 (78%)	1.242 (1)	<b>0.265</b>
	Others	8 (9%)	4 (22%)		
<b>Type of Family</b>	Nuclear	50 (60%)	4 (22%)	11.048 (2)	<b>0.004</b>
	Joint	12 (14%)	8 (44%)		
	Three generation	22 (26%)	6 (34%)		
<b>Birth order of child</b>	1st order child	3 (4%)	8 (44%)	27.785 (2)	<b>&lt;0.001</b>
	2nd order child	26 (31%)	6 (34%)		
	<b>More than 2nd order child</b>	<b>55 (66%)</b>	<b>4 (22%)</b>		