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"A STUDY OF RISK FACTORS FOR DEHYDRATION AMONG UNDER FIVE CHILDREN"

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ABSTRACT

Background: World Health Organization ranks diarrheal diseases as the second most common cause of mortality among children under 5 years of age in developing countries. As studies suggests lack of knowledge about breast feeding, malnutrition, unhygienic practices, concurrent infections, overcrowding, inadequate sanitation are the major risk factors causing severe dehydration in diarrhea. **Objectives:** 1) To study the Socio demographic Prolife of Diarrhea children and type of dehydration.2) To study the risk factors for dehydration among under five children. **Methodology:** A descriptive study was conducted in Mysore Medical College from April 2014 to October 2014. The data was collected from mothers of 97 children aged 0 to 5 years with diarrhea. Data was collected using a pre designed semi structured questionnaire which contained information regarding socio demographic profile and risk factors like low birth weight, Birth order, lack of immunization, presence of malnutrition, lack of exclusive breastfeeding, severity of the illness and health seeking behavior of the family. **Results:** In our study majority were less than 2 years, females, birth order 1 and belong to Hindu religion. In the study majority of mothers studied only till primary and from class 3 socio economic status, In the study 33% had grade1 malnutrition followed by grade 2, grade 4, grade 3 malnutrition. 22.7% children were born with low birth weight, 75.3% were exclusively Breast fed, 91.8% were fully immunized, 63.9% parents brought the children to hospital within 3days of illness and about 48.5% had average

frequency of 6 to 10 times stools per day. In the study 62.9% not heard about ORS and 95.9% did not know to prepare ORS. In the study it was found that severe dehydration was more common in children with average stool frequency of 6 to 10 times and low birth weight compared to other groups and it was statistically significant. **Conclusion:** The children with risk factors like presence malnutrition, lack of exclusive breast feeding, lack of immunization were more prone to develop severe dehydration.

KEY WORDS: Risk factors, Dehydration, under five children.

INTRODUCTION

World Health Organization ranks diarrheal diseases as the second most common cause of mortality among children under 5 years of age in developing countries and diarrhea is said to be leading cause of death during complex emergencies and natural disasters. Despite the increased availability of the health resources and widespread use of Oral Rehydration Salt, vitamin A supplementation and other measures, worldwide infant mortality rates are surprisingly high amounting to 760000 deaths worldwide. Current estimates in children under 5years suggests that there are about 1.4 billion episodes of diarrhea per year with 123 clinical visits annually.[1] During the year 2011, about 10.6 million cases with 1293 deaths were reported in India.[2]

Dehydration being the major cause of death due to diarrhea, several interventions addressing severe dehydration can effectively reduce mortality. These include initial stabilization assessment of hydration and rehydration therapy correcting electrolyte imbalance and use of necessary antibiotics. However only few tools are available to accurately assess dehydration and effectively implement interventions. Therefore identification of high risk children prior to the presentation of dehydration is the effective method of managing diarrhea in resource limited settings. As the various studies suggests lack of knowledge about breast feeding , malnutrition, unhygienic practices, concurrent infections overcrowded shelter, inadequate sanitation the major risk factors causing severe dehydration in diarrhea.[3] Besides, malnutrition and diarrhea are linked in a vicious cycle which has to be addressed.

Hence main aim of the study is to understand these risk factors by comparing the children with severe dehydration to those with no dehydration, so that prevention of severe dehydration in high risk children can be focused. Diarrhea causes about 11% of child deaths worldwide of which 90% occur in sub Saharan Africa and South Asia. Hence developing

countries are at greater risk for deaths due to diarrhea. India being the developing country with various national issues like poor sanitation, illiteracy, malnutrition, inadequacy of heath care services is more vulnerable for the deaths due to diarrhea. Therefore it is important to set up a strategy to reduce the severe dehydration caused by diarrhea for which proper understanding regarding risk factors , prognostic factors is required. Hence this study mainly focuses on risk factors for dehydration and making the strategies to reduce the same.

OBJECTIVES

1) To study the Socio demographic Prolife of Diarrhea children and type of dehydration.
2) To study the risk factors for dehydration among under five children.

METHODOLOGY

Source of data: Mothers of children aged between 0 to 5 years with diarrhea attending the KR hospital, Mysore.

Type of Study: Descriptive study.

Study design: Case series study.

Sampling unit: Child aged between 0 to 5 years attending the KR hospital, Mysore with diarrhea during the study duration

Sample size: All the diarrhea children aged between 0 to 5 years admitted during the study period were included in the study.

Sampling Technique: Non Probability Purposive sampling technique

Study period: April 2014 to October 2014

Inclusion criteria: a) Children aged between 0 to 5 years attending the KR hospital, Mysore with diarrhea during the study duration.

Exclusion criteria: Mothers of Children aged between 0 to 5 years with diarrhea not willing to participate in the study.

Method of data collection: All the mothers of Children aged between 0 to 5 years attending the KR hospital, Mysore with diarrhea during the study duration were interviewed after taking the written consent. The respondents are told that their participation was anonymous and entirely voluntary.

The current WHO definition of severe dehydration in young infant is based on the presence of two of the following three signs, (a) Lethargic or unconscious (b) Sunken eyes (c) Skin pinch goes back very slowly (> 2 seconds). No dehydration is considered when there are not enough signs to classify as some or severe dehydration.

Severe Dehydration among 2 Months to 5 Years is considered when presence of at least two of the following signs (a) Lethargic or unconscious (b) Sunken eyes (c) Not able to drink or drinking poorly (d) Skin pinch goes back very slowly. No dehydration is considered when there are not enough signs to classify as some or severe dehydration.

Data was collected using a pre designed semi structured questionnaire which contained information regarding socio demographic profile and risk factors like low birth weight, Birth order, lack of immunization, presence of malnutrition by using Gomez classification, lack of exclusive breastfeeding, severity of the illness and health seeking behavior of the family. History of immunization was elicited from parents and verified by checking the written document wherever available. A child was assessed to be completely immunized if he/she had received all vaccinations due for his age according to national immunization schedule.

Plan of Analysis / Statistical Tools

The data was entered in excel and analyzed using Epi-info Software version 3.4.3. Data obtained from the sample was analyzed with the help of descriptive statistics like frequencies and percentage. The factors influencing the dehydration were analyzed using chi square test. "p" value $\leq$ 0.05 at (95 % Confidence Interval) was taken as statistically significant.

Ethical clearance certificate was obtained by Ethical Committee of the Mysore medical college before the study was started.

RESULTS

Table 1: Socio Demographic profile of study subjects

Variables	Frequency(97)	Percent (100)
Age (In Years)		
Less Than 1	34	35.1
1 to 2	34	35.1
2 to 3	15	15.5
3 to 4	7	7.2
4 to 5	7	7.2
Gender		
Female	50	51.5
Male	47	48.5
Birth Order		
1	48	49.5
2	40	41.2
3	7	7.2

4	2	2.1
Place of Residence		
Rural	48	49.5
Urban	49	50.5
Informants		
Father	2	2.1
Grand Mother	7	7.2
Mother	88	90.7
Religion		
Christian	1	1
Hindu	66	68
Muslim	30	30.9
Mother Education		
Degree	2	2.1
High School	40	41.2
Primary School	44	45.4
PUC	11	11.3
Mother Occupation		
Housewife	94	96.9
Working	3	3.1
Type Of Family		
Joint	46	47.4
Nuclear	51	52.6
Socio Economic Status		
Upper Class	1	1
Upper Middle	23	23.7
Lower Middle	40	41.2
Upper Lower	27	27.8
Lower Class	6	6.2

In our study majority were in the age group of less than one year and 1 to 2 years (35.1%) followed by 15.5% in the age group of 2years to 3years and least was 7.2% children in the age group of 3 year to 4 year and 4year to 5years of age. In our study 51.5% were females and the rest 48.5% were male children. In the study majority of children about 49.5% were of birth order 1 followed by children of birth order 2 (41.2%), birth order 3 and 4 with 7.2% and 2.1% respectively. In the study children from urban and rural population occurred almost equally with 50.5% and 49.5 % respectively. In the present study informant was mostly mother about 90.7% & the rest grandmother and father was informant 7.2% and 2.1% respectively. Majority belonged to Hindu religion 68% next were the Muslims 30.9% and Christians occurred only for 1%.

In the study majority of mothers studied only till primary and high school that is 45.4% and 41.2% respectively followed by mothers educated till Pre University 11.3% and very few 2.1% were graduated with degree. In the study mothers of almost all children that is 96.9% were housewives and only 3.1% were working. In our study nuclear and joint families occurred at 52.6% and 47.4% respectively. Majority of the families were from class 3 socio economic status that is 41.2% followed by class 4, class 2, class 5 and class 1 with 27.8%, 23.5%, 6.2% and 1% respectively.

Table 2: Presence of Risk Factors

Variables	Frequency(97)	Percent (100)
Nutritional Status (Gomez Classification)		
Grade 1	32	33
Grade 2	15	15.5
Grade 3	5	5.2
Grade 4	9	9.3
Normal	36	37.1
Low Birth Weight		
No	75	77.3
Yes	22	22.7
Exclusive Breast Feeding		
No	24	24.7
Yes	73	75.3
Immunisation Status		
Fully Immunized	89	91.8
Partially Immunized	8	8.2
Duration of symptoms before availing hospital services		
up to 3 days	62	63.9
4 to 7days	25	25.8
> one week	10	10.3
Presence of fever		
No	35	36.1
Yes	62	63.9
Stool Frequency Per Day		
Up To 5 Times	32	33
6 To 10 Times	47	48.5
> 10 Times	18	18.6
Stoppage Of Breast Feeding In The Course Of Disease		
No	90	92.8
Yes	7	7.2
Consumption Of HAF During The Disease		

No	74	76.3
Yes	23	23.7
Knowledge about Signs of dehydration		
Don't Know	82	84.5
Know	15	15.5
Heard about ORS		
No	61	62.9
Yes	36	37.1
Preparation Of ORS		
No	93	95.9
Yes	4	4.1

In the study according to Gomez classification majority of children were normal 37.1% followed by children with grade1 malnutrition 33% and children With grade 2, grade 4, grade 3 malnutrition in frequency of 15.5%, 9.3% and 5.2% respectively. 22.7% children were born with low birth weight. In the study about three fourth of children that is 75.3% were exclusively Breast fed. 91.8% were fully immunized and the remaining 8.2% children were partially immunized. 63.9% parents brought the children to hospital within 3days of illness about 25.8% between 4days to 7days and the rest 10.3% visited hospital after a week. 63.9% of children had fever during diarrhea and about 48.5% had average frequency of 6 to 10 times stools per day and in 33% it was up to 5 times and18.6% had average stool frequency of more than 10 times per day. In the study 92.8 % of children were not stopped from breast feeding during the course of illness and 7.2% were stopped from breast feeding, 76.3% were not given any HAF (Home Available Fluids) during the course of Disease and majority of the informants 84.5% did not know signs of dehydration. In the study about 62.9% of informants had not heard about ORS and 95.9% did not know to prepare ORS.

Table 3: Distribution of children based on Dehydration status

	Frequency	**Percent**
No Dehydration	22	22.7
Some Dehydration	51	52.6
Severe Dehydration	24	24.7
Total	**97**	**100**

In the study majority of children 52.6% had some dehydration followed by severe and no dehydration in 24.7% and 22.7% respectively.

Table 4: Association between Socio demographic profile and type of dehydration

Variables	Type of Dehydration			
	No Dehydration(22)	Some Dehydration(51)	Severe Dehydration(24)	p value
Age				
Less than one Year	10	16	8	
1 to 2 Years	5	20	9	
2 to 3 years	2	7	6	
3 to 4 years	4	3	0	
4 to 5 years	1	5	1	0.21
Sex				
Male	8	26	13	
Female	14	25	11	0.42
Mother education				
Degree	0	2	0	
PUC	3	8	0	
High School	10	20	10	
Primary School	9	21	14	0.33
Mother occupation				
Housewife	20	50	24	
Working	2	1	0	0.16
Socio Economic Status				
Upper Class	0	0	1	
Upper middle	6	12	5	
Lower middle	9	23	8	
Upper lower	7	13	7	
Lower Class	0	3	3	0.54
Type of Family				
Nuclear	9	29	13	
Joint	13	22	11	0.44
Address				
Rural	11	26	11	
Urban	11	25	13	0.91

In the study children between 1 to 2 years of age, male child, mothers education till primary school and children of non working mothers, belong to middle class and lower middle, nuclear families and residing in urban area developed severe dehydration more in comparison with other groups but it was not statistically significant.

Table 5: Association between risk factors and type of dehydration

Variables	Type of Dehydration			
	No Dehydration (22)	Some Dehydration (51)	Severe Dehydration (24)	p value
Average Frequency Of Stools Per Day				
Up to 5 times	11	19	2	
6 to 10 times	9	27	11	
Above 10 times	2	5	11	<0.001
Duration Of Symptoms Before Availing Hospital Services(In Days)				
Up to 3 days	18	32	12	
4 to 7 days	2	15	8	
Above one week	2	4	4	0.17
Exclusive Breast Feeding				
Yes	18	39	16	
No	4	12	8	0.47
Nutritional status (Gomez classification)				
Normal	9	21	6	
Grade 1	7	16	9	
Grade 2	4	7	4	
Grade 3	0	3	2	
Grade 4	2	4	3	0.88
Immunization Status				
Fully Immunized	22	45	22	
Partially Immunized	0	6	2	0.24
Low Birth Weight				
Yes	3	9	10	
No	19	42	14	0.03
Presence of fever				
Yes	16	30	16	
No	6	21	8	0.49
Heard about ORS				
Yes	10	20	6	
No	12	31	18	0.32
Know to Prepare ORS				
Yes	2	2	0	
No	20	49	24	0.32

In the study it was found that severe dehydration was more common in children with average stool frequency of 6 to 10 times and low birth weight compared to other groups and it was statistically significant. In our study it was found that severe dehydration was more common in children with duration of disease more than a week, among not exclusively breast fed children, grade 3 &4 malnutrition children, partially immunized children, presence of fever,

mother not heard of oral rehydration solution and mothers did not know how to prepare oral rehydration solution   however it was not statistically significant.

DISCUSSION

In our study consisting of 97 subjects proportion of severe dehydration was found to be more in age group of 1 to 2years followed by less than 1year, more among male children than female children. In the study most of children occurred with birth order of 1 or 2 and when compared severe dehydration was more among 2nd birth order children. It was also found that severe dehydration was more among children from nuclear families compared with joint families may be due to lower knowledge on child rearing practices in mothers of nuclear families and it was also seen that dehydrating disease was more in children of families belonging to middle class and lower middle class and it was also more children from urban population than rural population as most of them came from urban slums with low socio economic status. In the study it was also found that children of mothers educated only till primary school suffered from severe dehydration than those educated till high school.

In the study conducted on the risk of dehydrating diarrhoea in vulnerable period after weaning by Sandra Costa Fuchs, et al on risk of dehydrating diarrhoea was more within 9 months and more in males[4] and another study conducted by same group on prognostic factors for dehydration it was found that higher the birth order, low socio economic status, illiterate mother higher the chances of severe dehydration.

In the study by Kothari.V.R et al. on the risk factors for dehydration in acute watery diarrhoea it was found that majority of children belonged to age group of 0 to 24 months more among female children and among children from rural population. The study also said that children of mothers who are illiterates suffered from dehydration compared with those of mothers educated till primary school and more among children belonging to lower socio economic class.[5]

In the study on socio demographic determinants of persistent diarrhoea among under 5 children by S.S.Avachat et al. on 652 children it was found that dehydrating diarrhoea was more common in age group of 13 to 24 months and 25 to 36 months and more among male children and in children from families in to middle and lower middle class and more among children from joint families. The study also found that children of illiterate mothers were more prone for dehydration due to diarrhoea compared with children of literate mothers.[6]

In the study it was found that out of 24 children who were not exclusively breast fed 8 developed severe dehydration compared to 16 children who developed severe dehydration among 73 exclusively breast fed children saying that breast feeding decreases the chances of dehydration in children. In our study more than half of children belonged to normal nutritional status or grade 1 malnutrition according to Gomez classification and was found that severe dehydration was more among those with grade 3 and 4 malnutrition compared to normal children. It was found that partially immunized children developed severe dehydration more than fully immunized children. In the study it was also found out that 10 children among 22 low birth weight children and only 14 children among 75 normal birth weight children developed severe dehydration hence low birth weight children are more prone for developing severe dehydration due to diarrhoea.

Further it was also found that children of mothers with poor knowledge about oral rehydration solution and its importance developed severe dehydration more the children of mothers who knew about oral rehydration solution and its importance. In the study it was it was found that most of children with severe dehydration had average stool frequency of 6 to 10 times per day and chances of developing severe dehydration was more in late health seeking behaviour families. The study conducted Kothari.V.R et al on risk factors for the development of severe dehydration conducted on 200 children 66 male and 134 female children severe dehydration was more among children not exclusively breast fed in malnourished children.[5]

In the study conducted by Ibrahim.A.B et al on diarrhoea and child feeding practices on 250 subjects severe dehydration was more common among unvaccinated children. The study also said that not changing breast feeding practices and giving home available fluids decreased the risk of dehydration.[7] In the study conducted on socio demographic determinants of diarrhoea by S.S.Arachat, et al also said that malnourished children are more prone for dehydration and it also says that there is significant association between early introduction of top up feeds and development of recurrent diarrhoea.[6]

In the study conducted on risk and prognostic factors for diarrhoeal disease by Fuchs.S.C and Victoria.C.G the risk of severe dehydration more among low birth weight children malnourished children compared to normal weight children. Study also shows that poor nutritional status and interruption of breast feeding during the course of disease increased the chances of dehydrating diarrhoea by 4.5 fold and 6 fold respectively. It also says that children

of mothers who were literates and had knowledge about importance's of ORS had decreased risk of developing dehydrating diarrhoea.[8]

CONCLUSION

In the study children between 1 to 2 years of age, male child, mothers education till primary school and children of non working mothers, belong to middle class and lower middle, nuclear families and residing in urban area developed severe dehydration more in comparison with other groups but it was not statistically significant. In the study it was found that severe dehydration was more common in children with average stool frequency of 6 to 10 times and low birth weight compared to other groups and it was statistically significant. In our study it was found that severe dehydration was more common in children with duration of disease more than a week, among not exclusively breast fed children, grade 3 &4 malnutrition children, partially immunized children, presence of fever, mother not heard of oral rehydration solution and mothers did not know how to prepare oral rehydration solution however it was not statistically significant.

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