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Original Research Article

Prevalence of 'at risk' under five children in a rural area of central India: a cross sectional study

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ABSTRACT

Background: Children constitute the most vulnerable section of the community. The health status of children serves as sensitive indicator of overall health of entire community. The major causes of deaths in the age group 0-5 years are preventable. At Risk group is a group of individuals in whom the frequency of risk factors is more than the other groups. It is therefore necessary to identify particularly those 'At Risk' and provide them with efficient paediatric services, because it is these 'At Risk' babies, which contribute so largely to perinatal, neonatal and infant mortality.
Methods: A community based cross sectional study was carried out in a rural area of Nagpur during period of December 2010 to May 2012 to identify prevalence of At Risk under five children and associated demographic, socioeconomic and environmental factors. Sample size taken was 400. By systematic sampling method every 14th house was selected for the study. Epi info software was used for analysis.
Results: In the study we found that the prevalence of 'At Risk' children were 70.5%. A total of 71.6% male children were 'At Risk' as compared to 68.9% female children. Significant association of 'At Risk' children was found with education of parents, type of family, socioeconomic status, housing, overcrowding and ventilation.
Conclusions: Special provisions of health care facilities for under five children, need based training to the health care providers and necessary information, education & communication campaigns are need of the hour to bring down infant morbidity and mortality.

Keywords: At risk, Rural area, Under five

INTRODUCTION

Creating a world that is truly fit for children does not imply having the confidence that our children would not die of measles or malaria. It means having access to clean water and proper sanitation. It means having primary schools nearby that educate children, free of charge. It means changing the world with children, ensuring their right to participate, and that their views are heard and considered. It means building a world fit for children, where every child can grow to adulthood in health, peace and dignity but with increasing population there is increase in poverty, illiteracy, poor housing and poor standards of living.

The overall perspective of health problems in our country is dominated by overpopulation. The brunt of this strain is felt by the vulnerable groups, i.e. mothers and children. Although a lot of research has been done in the field of maternal and child health, from the very beginning, it was the mother who got the main attention. The 'at risk' pregnancy was the chief concern with final aim of a healthy mother. The sub-area of MCH, 'a healthy baby' was neglected. [1]

Children constitute the most vulnerable section of the community. The health status of children serves as sensitive indicator of overall health of entire community. Several factors are known to be responsible for causing higher rates of morbidity in children. While many of the factors are related to health care services and their uptake by the population, several other factors are entwined socio cultural factor of the society.[2]

About half of under-five deaths occur in only five countries: India, Nigeria, Democratic Republic of the Congo, Pakistan and China. India (22%) and Nigeria (11%) together account for a third of all under-five deaths. Over 70% of under-five deaths occur within the first year of life. The proportion of under-five deaths that occur within the first month of life (the neonatal period) has increased about 10% since 1990 to more than 40%. Almost 30% of neonatal deaths occur in India. Globally, the four major killers of children under five are pneumonia (18%), diarrhoeal diseases (15%), preterm birth complications (12%) and birth asphyxia (9%). Undernutrition is an underlying cause in more than a third of under-five deaths.[3]

The major causes of deaths in the age group 0-5 years are preventable. At risk group is a group of individuals in whom the frequency of risk factors is more than the other groups.[4] It is therefore necessary to identify particularly those 'at risk' and provide them with efficient paediatric services, because it is these 'at risk' babies, which contribute so largely to perinatal, neonatal and infant mortality.[1]

We start with the idea that a measure of risk is a proxy for need- need for promotive and preventive care- and the fact that knowledge available before the predicted event allows time for proportionate response. Hence the slogan "Something for all but more for those in need- in proportion to the need".[5]

METHODS

Study design

Community based, cross-sectional study.

Study period

December 2010 to May 2012.

Study area

The study was carried out at RHTC area of a Tertiary Care Hospital.

Study population

Children under-five years of age in the area.

Sample size

400

The sample size was estimated as follows

Sample size: $n = 4pq/ d^2$

n = sample size
p = prevalence
q = 100 – prevalence
d = absolute point precision 5%

So, the sample size would be

n = 4x65x35/25
n = 364

For better coverage it was decided to round up and take a sample size of 400.

Statistical analysis

By Epi-Info Software 3.4.3.

The study was carried out at rural area, which is an adopted area under administrative control of tertiary care hospital of central India. The population of the area was 45,523 and under five populations was 5523.Based on the prevalence of 'At Risk' 65% and absolute precision of 5%, using the formula $4pq/ d^2$ sample size of 364 was calculated. For better coverage sample size of 400 was taken.

A house to house survey was done. There were a total of 9832 houses, the first house was selected by lottery method and then by systematic sampling method every 14^{th} house was selected for the study

(K=total population/ sample size; K= 5523/400 = 13.8 = 14)

About 5-7 houses were visited daily and on an average 5-7 children were examined per day. The study was carried out 3 days /week. Parents were briefed as per Patient information sheet and thereafter the Informed consent was obtained. The youngest child (under-five) was included in the study out of the eligible children found in the selected family. In case of finding no eligible child in the selected house, the next adjacent house (right side) was consecutively selected till a eligible child was included in the study.

All information was obtained on pre-tested Performa

The 'At Risk' factors included in the study were:

1. Weight below 70% of expected weight for age.
2. Introduction of bottle feeding before 6 months.
3. Delay in giving supplementary weaning food.

4. Birth weight of less than 2500 grams.
5. Twin birth.
6. Birth order 4 or above.
7. Spacing of children <2 yrs.
8. Mid-arm circumference <12.5 cms (1-5 yrs)
9. History of deaths of >2 siblings below age of 12 months
10. Death of either or both parents.
11. Mother working outside for >8 hrs a day
12. Children attending the OPD for >5 visits &/or ≥1 IPD admission during last 3 months, excluding immunization and health education sessions.

Child was considered 'At Risk' if he/ she fulfilled any of the enlisted criteria.[1,6,17]

RESULTS

In present study the most frequently seen risk factor was weight below 70% of expected weight for age. It was found in 154 (38.5%) of children as seen in Table 1 Followed by birth weight less than 2500 grams seen in 34% children.

In present study we found that the prevalence of ''At Risk'' children was 70.5%. A total of 71.6% male children were ''At Risk'' as compared to 68.9% female children. The highest percentage of ''at risk'' children were in the age group of 25-36 months (81.66%) followed by 12-24 months (78.57%) and 0 -12 months (68.18%) respectively.

Table 1: Distribution of children according to 'At Risk' factors (n=400).

Sr. no	'At Risk' factors	Children frequency	Percentage (%)
1	Weight below 70% of expected weight for age	154	38.5
2	Introduction of bottle feeding before 6 months	128	32
3	Delay in giving supplementary weaning food	104	26
4	Birth weight of less than 2500 grams.	136	34
5	Twin birth.	5	1.25
6	Birth order 4 or above.	36	9
7	Spacing of children <2 yrs	96	24
8	Mid-arm circumference <12.5 cms (1-5 yrs)	64*	16
9	History of deaths of >2 siblings below age 12 months	7	1.75
10	Death of either or both parents.	6	1.5
11	Mother working outside for >8hrs a day	60	15
12	Children attending the OPD for >5 visits &/or ≥1 IPD admission during last 3 months excluding immunization sessions or health education sessions.	79	19.75

*Age 1-5 yrs; n=246 Multiple responses allowed.

Table 2: Association of educational status of mother with 'At Risk' children (n=400).

Education status of mother	No of children	Percentage (%)	'At Risk' children	Percentage (%)	X^2	P value	OR
Illiterate	67	16.75	55	82.08	15.51	0.0008	5.24
Primary	82	20.5	67	81.70			5.10
Middle	72	18	54	79.16			3.43
High	90	22.5	57	63.33			1.97
Intermediate	59	14.5	35	59.32			2.86
Graduate /Post graduate	30	7.5	14	46.66			1
Total	400	100	282	70.5			

Chi square for trend.

Table 3: Association of type of family with 'At Risk' children (n=400).

Type of family	Frequency	Percentage (%)	'At Risk' children	Percentage (%)	X^2	P value	OR
Three generation	45	11.25	37	82.22	7.62	0.005	1.89
Joint	119	29.75	91	76.47			
Nuclear	236	59	154	65.25			
Total	400	100	282	70.5			

Table 4: Association of housing, overcrowding and ventilation with 'At Risk' children (n=400).

Variables	Children surveyed	'At Risk' children		X^2	P value	OR
		No.	Percentage (%)			
Housing						
Kucha	89	73	82.02	31.34	0.000	4.79
Kuchapucca	188	149	79.25			4.01
Pucca	123	60	48.78			1
Total	400	282	70.5			
Overcrowding						
Present	168	131	77.97	7.78	0.00052	1.90
Absent	232	151	65.86			
Total	400	282	70.5			
Ventilation						
Unsatisfactory	186	145	77.95	9.30	0.002	1.99
Satisfactory	214	137	64.01			
Total	400	282	70.5			

Significant association between education status of mother and father with ''At Risk'' children and it was seen that there was decrease in the number of ''At Risk'' children with increase in the level education of parents.

Significant association was found between type of family and ''At Risk'' children. The association of type of family (3 generation and joint family combined vs. nuclear family) and ''At Risk'' children was calculated using chi square. (x^2 =7.62, p=0.005, OR=1.89).

A significant association was found between housing, overcrowding and ventilation with ''At Risk'' children using chi square test. Test of association showed a p value <0.01 for all three variables. Housing and ''At Risk'' children showed definite trend that suggests that as the quality of housing increases the number of ''At Risk'' children decrease. Children in overcrowded houses are 1.9 times more likely to be ''At Risk'' as compared to children in houses where there is no overcrowding.

DISCUSSION

A community based cross sectional study was carried out in a rural area from December 2010 to May 2012. The purpose of study was to find out the prevalence of ''At Risk'' under five children and associated demographic, socio economic and environmental factors.

In present study the most frequently seen risk factor was weight below 70% of expected weight for age. It was found in 154 (38.5%) of children as seen in table 1. Followed by birth weight less than 2500 grams seen in 34% children, Introduction of bottle feeding before 6 months seen in 32% children, delay in giving supplementary weaning food seen in 26% children, birth spacing less than 2 years seen in 24% of children. Aswar et al and Bhasin et al also found weight for age less than 70% as the most common risk factor in their respective studies i.e. 39% and 40.5% respectively.[10,11] Bhat et al in his study found 60.45% of the children were malnourished.[12] Similar finding was seen in studies by Sharma et al, Biswas et al which is higher than the present study.[1,13] Singh et al studied the prevalence of high risk children under five in village near Delhi and found that birth interval less than two years and malnutrition were most frequent risk factors.[14]

It was found that there was significant association between education status of mother and father with ''At Risk'' children and it was seen that there was decrease in the number of ''At Risk'' children with increase in the level education of parents. Sharma et al found that literacy of parents and 'at risk' children had significant relationship.[1] In study of Aswar et al it was seen that statistically significant association was present between 'at risk' children and illiteracy and poverty, Mondal et al in his study found risk of child mortality decreased with increased female education.[10,15] Luthra et al in her study observed that under nutrition was significantly correlated with age and mother's education.[16] Avachat et al in her study observed that there was significant association of literacy status of mother with the presence of risk factor in children.[17] Jha et al in his study observed that SES, illiteracy, age, nuclear family were significantly associated with LBW.[18]

It was found that there was significant association between type of family and ''At Risk'' children. The association of type of family (3 generation & joint family combined vs. nuclear family) and ''At Risk'' children was calculated using chi square. (x^2=7.62, p=0.005, OR=1.89). Luthra et al in her study found that under nutrition was significantly correlated with nuclear family and iJha et al in his study observed that SES, illiteracy, age, nuclear family were significantly associated with LBW.[16,18]

A significant association was found between housing, overcrowding and ventilation with ''At Risk'' children

using chi square test. Test of association showed a p<0.01 for all three variables. Housing and ''At Risk'' children showed definite trend that suggests that as the quality of housing increases the number of ''At Risk'' children decrease. Children in overcrowded houses are 1.9 times more likely to be ''At Risk'' as compared to children in houses where there is no overcrowding.

Children residing in houses where there was inadequate ventilation were 1.99 times more likely to be ''At Risk'' compared to children residing in houses where there was adequate ventilation. Avachat et al in her study observed that there was significant association of environmental conditions with the presence of risk factor in children.[17] Sharma et al found that housing, overcrowding and ventilation were significantly associated with 'At risk' children.[1]

CONCLUSION

Looking into the large number of identified risk factors and the presence of more than one factor in many of the 'At risk' children, it is recommended that the detailed criteria for establishing children, especially under five, 'At risk' should be developed, agreed and disseminated among the health care providers for early diagnosis, treatment and specialized care. In view of this, it is recommended that there is an urgent need and scope for operationalization of 'at risk' under five children through enhancement of competence of the staff and providing necessary logistics support. Special provisions of health care facilities for under five children, need based training to the health care providers and necessary information, education & communication campaigns are need of the hour to bring down infant morbidity and mortality.

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