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Original Research Article

A study of nutritional assessment in children with pneumonia or diarrhoea and pneumonia and diarrhoea both admitted at a tertiary care hospital

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ABSTRACT

Introduction: Adequate Nutrition is essential for development of human. Malnutrition includes both undernutrition and over-nutrition and refers to deficiencies, excesses or imbalances in the intake of energy, protein and/or other nutrients. Benefits of good health are perceived not only at the individual level but also at the level of society and country.

Aim & Objective: To study the proportion and severity of malnutrition in children admitted with pneumonia and Acute Diarrhoea. To study the correlation of severity of malnutrition in both pneumonia and diarrhoea in children.

Materials and Methods: A cross sectional study was conducted 374 among Paediatrics patient between 1 month to 5 years of age, admitted at Paediatric ward, New Civil Hospital, Surat.

Result: Majority of patients were male (n=236, 63.10%). Maximum subjects were in age range 1-3 years (n=194, 51.87%), followed by 103 subjects ≤1 year of age and 77 subjects were >3-5 years of age. Only 288 subjects were completely immunized (77%) and rest of 86 patients were partially immunized (23%). In present study, maximum subjects were full term babies (n=283, 75.67%) and 91 patients were preterm infants (24.33%). And maximum subjects were normal birth weight (n=276, 73.80%) and 98 subjects (26.20%) had low birth weight at the time of delivery.

Conclusion: SAM must be identified and handled carefully since it causes more difficulties and requires a longer hospital stay than MAM and the regular nutrition group. MAM, which is commonly ignored, must be recognised and monitored because it can eventually result in SAM.

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1. Introduction

Adequate Nutrition is essential for development of human. Malnutrition includes both undernutrition and over-nutrition and refers to deficiencies, excesses or imbalances in the intake of energy, protein and/or other nutrients. Benefits of good health are perceived not only at the individual level but also at the level of society and country. Health of a person is determined by interplay of various factors like dietary factors, economic factors, social factors, lifestyle

related factors, environmental factors, government policies etc.¹ Formation of an individual's health is laid in early phase of life. It is a well-known fact that in some developing nations, like India, nearly half percent of children under 5 years of age death occur due to poor nutrition. It is difficult for the poor to afford a cost of treatment mostly suddenly occurring out-of-pocket expenditures.² About 12.5-15% of world populations are under 5 years age group and mortality rate is 25-30% among the developing countries.^{3,4} Childhood malnutrition is comparatively high in Southern Asia like 45-48% in Bangladesh, India and Nepal, 38% in Pakistan and 30% in Sri Lanka.⁵ More than 50% of

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child's death occurs due to diarrhea, pneumonia, acute respiratory illness, malaria, measles, etc.⁶ Diarrhea and pneumonia are the two-leading cause of child death in the world.^{7–9} About 17% and 21% deaths occur due to childhood diarrhea and pneumonia respectively.^{10,11} Every year more than 1.9 million children die due to pneumonia; whereas diarrhea kills about 4 million children.^{12,13} India 38% of under 5 children are stunted which suggest chronic malnutrition and 21% of under-5 children are wasted which suggest acute malnutrition, while 36% of under-5 children are under weight.¹⁴ In Gujarat – NFHS (2015-16), the infant mortality rate in rural areas (39 deaths per 1,000 live births) was higher than in urban areas (27 deaths per 1,000 live births).¹⁵ Acute Respiratory infections (ARI) are the main cause of morbidity worldwide. In developing countries like India, Pneumonia is one of the main causes of death in under 5-year age children. Severe malnutrition increasing the risk of ARI by 1.85 folds.¹⁵ Thus, the present research was undertaken with moto of nutritional assessment in children with pneumonia and diarrhea admitted in pediatric ward at a tertiary care hospital in south Gujarat and observe the impact of malnourishment upon the high prevalence of diarrhea and pneumonia infection among them.

2. Aim & Objectives

To study the proportion and severity of malnutrition in children admitted with pneumonia and Acute Diarrhoea. To study the correlation of severity of malnutrition in both pneumonia and diarrhoea in children.

3. Materials and Methods

A cross sectional study was conducted 374 among Pediatrics patient between 1 month to 5 years of age, admitted at Pediatric ward, New Civil Hospital, Surat from June 2021 to September 2022.

3.1. Inclusion criteria

1. Children between 1 month to 5 years of age admitted with pneumonia.
2. Children between 1 month to 5 years of age admitted with acute diarrhoea.
3. Children between 1 month to 5 years of age admitted with Pneumonia and diarrhoea both.

3.2. Exclusion criteria

1. Newborn up to 1 month of age.
2. Not willing for study.
3. Children with secondary cause of malnutrition like chronic illness or global developmental delay.

All data of history, examination, investigation, diagnosis and management was recorded systemically in proforma.

All routine investigations complete Blood count, chest- X-Ray, Stool routine and microscopic examination and stool culture and sensitivity was done in all patients according to their complaints. Patients was closely monitored for complications. Patients' outcome was recorded in the form of discharge, death, DOR, DAMA response to treatment etc.

4. Results

Table 1: Gender distribution among the study subjects

Gender	N	%
Male	236	63.10
Female	138	36.90
Total	374	100

Out of the total 374 subjects, majority of patients were male (n=236, 63.10%) and remaining 138 subjects were females (36.90%). [Table 1]

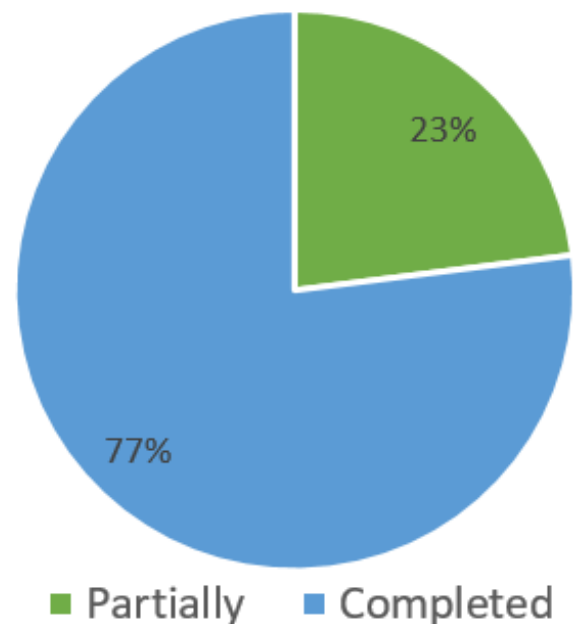


Figure 1: Immunization status among the study subjects

Total 288 subjects were completely immunized (77%) and rest of 86 patients were partially immunized (23%). [Figure 1]

Of the 199 subjects with diarrhea, 80 had no dehydration (40.20), 102 had some dehydration (51.25%) and 17 subjects had severe dehydration (8.54%). (Figure 2)

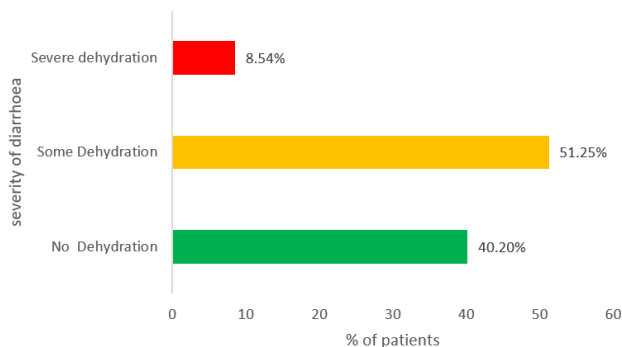
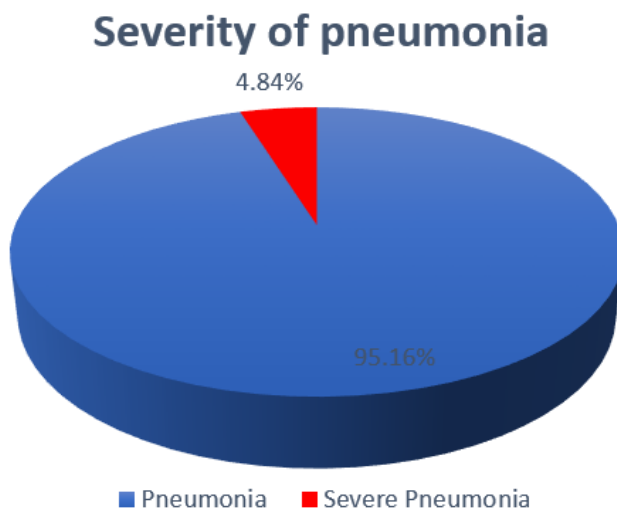
Of the 124 subjects with pneumonia, only 6 had severe pneumonia (4.84%) and 118 subjects had pneumonia (95.16%). (Figure 3)

Total 42 subjects (35.6%) had MAM and remaining 25 subjects (21.18%) had SAM. Of the 6 subjects with severe

Table 2: Severity of malnutrition among the study subjects according to pneumonia

Severity of Malnutrition	N	Diarrhea+ Pneumonia and diarrhea		Pneumonia		Severe Pneumonia		p value
		N	%	N	%	N	%	
Normal	221	169	67.60	51	43.22	1	16.67	0.000022*
MAM	88	44	17.60	42	35.60	2	33.33	
SAM	65	37	14.8	25	21.18	3	50.00	
Total	374	250	100	118	100	6	100	

*: statistically significant

**Figure 2:** Severity of diarrhea among the study subjects**Figure 3:** Severity of pneumonia among the study subjects

pneumonia, 1 (16.67%) had normal nutrition, 2 subjects (33.33%) had MAM and 3 subjects (50%) had SAM. There was a statistically significant difference present in severity of malnutrition when patients were divided according to presence of pneumonia ($p=0.000022$). (Table 2)

5. Discussion

In present study, out of the total 374 subjects, majority of patients were male ($n=236$, 63.10%) and remaining

138 subjects were females (36.90%). Upadhyay RP et al., (2015)¹⁵ found in their study that 56.6% of children were males and rest were females. According to findings of Ferdous F et al., (2013)¹⁶ 61% of the study children were male. Savitha MR et al., (2020)¹⁷ found that 62.9% of study patients were males. But according to Adriani A, Simarmata VP (2022)¹⁸ 53.7% of the study subjects were females. In current study, total 288 subjects were completely immunized (77%) and rest of 86 patients were partially immunized (23%). Of the 199 subjects with diarrhea, 80 had no dehydration (40.20), 102 had some dehydration (51.25%) and 17 subjects had severe dehydration (8.54%). In study done by Savitha MR et al., (2020),¹⁷ of the total 31 subjects with diarrhea, 6 (19.35%) subjects had no dehydration, 24 (77.42%) had some dehydration and 1 (3.22%) subject had severe dehydration. Of the 124 subjects with pneumonia, only 6 had severe pneumonia (4.84%) and 118 subjects had pneumonia (95.16%). These results were almost similar to result of Savitha MR et al., (2020).¹⁷ According to Savitha MR et al., (2020),¹⁷ of the total 67 subjects with pneumonia, 4 subjects (5.97%) had severe pneumonia and 63 patients (94.03%) had pneumonia. In this study, 42 subjects (35.6%) had MAM and remaining 25 subjects (21.18%) had SAM. Of the 6 subjects with severe pneumonia, 1 (16.67%) had normal nutrition, 2 subjects (33.33%) had MAM and 3 subjects (50%) had SAM. There was a statistically significant difference present in severity of malnutrition when patients were divided according to presence of pneumonia. But according to result of Savitha MR et al., (2020),¹⁷ there was no significant association between the severity of pneumonia and malnutrition. Therefore, the prevalence of pneumonia was the same among both MAM and SAM children. Ruutu P et al., (1990)¹⁹ in their study, concluded that the relative risks for morbidity and mortality for both acute upper and lower respiratory tract infections were higher in children with malnutrition compared to normal children.

6. Conclusion

In comparison to children with normal nutrition, both children with moderate acute malnutrition and those with severe acute malnutrition had higher rates of diarrhea and pneumonia, which are the primary causes of under-five

mortalities. This suggests that appropriate steps should be taken to ensure that children are receiving enough nourishment, as this can result in complications including pneumonia and diarrhea. SAM must be identified and handled carefully since it causes more difficulties and requires a longer hospital stay than MAM and the regular nutrition group. MAM, which is commonly ignored, must be recognized and monitored because it can eventually result in SAM. Therefore, the following benefits can be obtained if emphasis on children's nutritional status is increased in national programs: Reduce the prevalence of pneumonia and diarrhea, which are the 2 main causes of under-five mortality in children. By doing so, mortality from complications like septicemia can be avoided, and the length of these children's hospital stays can be cut short (by preventing SAM from developing in the first place).

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