Original Article

IMNCI Based Morbidity Patterns of Sick Children at Children Hospital CMC Hospital Larkana

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ABSTRACT

Objective: To determine the morbidity patterns of the sick children 2 months- 59 months according to Integrated Management of Childhood Illness (IMNCI) criteria.

Study Design: Descriptive Cross Sectional Study

Place and Duration of Study: This study was conducted at the Children Hospital, CMCH, Larkana from May 2021 to March 2023.

Materials and Methods: Total number of 113 sick children were included in the study according to the inclusion criteria. Final diagnosis was made based on IMNCI guidelines using the history, clinical examination, necessary laboratory investigations like, random blood sugar test, malarial parasite test, examination on glass slide, serum urea creatinine test, serum calcium test, chest x-ray, cerebrospinal fluid detailed reports. The data was obtained using study specific questionnaire. Later the data was entered into SPSS version 23 for analysis.

Results: The average age of the patients was 23.78±16.72 months. There were 64.6% males and 35.4% females. Severe pneumonia was observed in 26.5% children followed by febrile fit 23.9%, pyogenic meningitis 12.4%, epilepsy 6.2%, cerebral palsy 5.3%, encephalitis 5.3%, hypokalemia 5.3%, severe malaria 4.4%, tuberculosis meningitis 3.5% and croup and asthma were also observed.

Conclusion: The IMNCI guidelines offer advantages in accurate childhood illness identification, combined treatment, mother-caregiver counseling, and improved care quality for sick children at the referral level. In our findings, pneumonia and febrile fit were observed to the most common morbidity patterns with 26.5% and 23.9% respectively.

Key Words: Morbidity Patterns, Pneumonia, Diarrhea, Malaria, Measles, Malnutrition.

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INTRODUCTION

Every year, around 10 million children, including four million newborns, die around the world, with the majority of these deaths occurring in low-income nations such as Pakistan. The international medical community faces a challenge in developing countries with persistently high childhood mortality rates.[1] Pakistan is a low-income country that ranks third in Asia in terms of under-five mortality, with an average of 1100 deaths each day.[2]

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In underdeveloped nations, the majority of mortality among children under the age of five are caused by five prevalent diseases: pneumonia, diarrhoea, malaria, measles, and malnutrition.

The Integrated Management of Childhood Illness plan was developed in collaboration with the UN Children's Fund in the mid-1990s (IMNCI). Specific disease-based programmes, such as acute respiratory infection (ARI) and diarrheal disease control (CDD), as well as malaria control and malnutrition, have previously been established by the WHO. The IMNCI plan, in contrast to existing initiatives, targets all common childhood ailments and ensures access to all children.[3,4] The IMNCI programme also has other advantages, such as lowering missed immunization opportunities, promoting breastfeeding, nutritional counseling, vitamin A and iron supplements, and worm infestation treatment. The IMNCI programme includes three key characteristics. First, because a child frequently has more than one difficulty at a time, it addresses all of the child's issues at the same time. Second. It does not necessitate the use of expensive equipment such as a stethoscope, microscope, or X-ray. Third, there is no

need for technical knowledge. The programme can be implemented by any first-line health worker. The implementation phase of the IMNCI began in February 1999.[4] International studies have revealed a wide range of results. Research in Egypt shows IMNCI approach improves clinically 60% of children, compared to only 12% using Non-IMNCI protocol.[5]

Rationale: IMNCI strategy integrates childhood illnesses promotion, prevention, and management; limited data on young children's diagnosis and outcomes requires evaluation and scientific data collection.

Operational Definitions:

Sick Child: Presents with general danger signs (convulsions, vomiting everything, refusal to feed) according to IMNCI.[6] However, in our study; all the children classified under pink color coded triage based on IMNCI classification were labeled as sick children.

MATERIALS AND METHODS

This study was conducted at the Children Hospital, CMCH, Larkana from May 2021 to March 2023.

Sample Size: Total 113 cases of very severe disease were included. Raosoft calculator was used to calculate the appropriate sample size by using prevalence of very severe disease (8%) with 95% confidence interval and less than 5% of margin of error.

Sampling Technique: Non-probability Consecutive Sampling

Study Design: Descriptive cross sectional study

Sample Selection:

Inclusion Criteria:

Children aged between 2 months to 59 months
Patients of either gender.
Patients of very severe disease.
Parents giving informed Consent

Exclusion Criteria:

Outdoor patients.
Patients who present with dangers sign
Patients with epilepsy and cerebral palsy presenting with general danger sign
Age more than 59 months
Patients who didn‟t consent.

Data Collection Procedure:

The study was conducted in the Department of Pediatric Medicine Unit-1, CMC Children Hospital, Larkana, after the approval of synopsis from the SMBBMU research department and permission from the hospital's ethical review committee. This study enrolled all the children who met the inclusion criteria. To avoid confounding variables, rigorous exclusion criteria were applied. Parents and guardians were told about the research methodology, and written informed consent was obtained from them before data was input into a study-specific proforma. A complete history of the patient's age, gender, weight, height and clinical presentation was collected, as well as a general physical examination. patients were treated according to WHO protocol, based on criteria of history, clinical examination, and some necessary laboratory investigations as needed, such as blood sugar, Malarial parasite, examination on glass slide, serum urea creatinine, Serum calcium, Chest X-Ray, Cerebrospinal fluid detailed reports.

RESULTS

About 113 sick Children according to Integrated Management of Childhood Illness (IMNCI) criteria were recruited in the study. The mean age was 23.78±16.72 months and age distribution of the cases is shown in table 1. There were 73(64.6%) male and 40(35.4%) female as shown in table 1. Regarding presenting complain, 43(38.1%) were not able to drink or breastfeed, 12(10.6%) were vomit everything, 17(15%) child had convulsion, 20(17.7%) had lethargic or unconscious, 53(46.9%) were convulsing now and 2(1.8%) had looked or felt for stiff neck (table2).

Table No.1: Demographic Characteristics n=113

Variables		Frequency	Percentage
Mean Age	23.78±16.72 months		
Age	< 12 months	38	33.63
	12-36 months	54	47.79
	>36 months	21	18.58
Gender	Male	73	64.60
	Female	40	35.40

Table No.2: Clinical Presentation of Sick Children

Clinical Presentation	Frequency	Percentage
Not able to drink or breastfeed?	43	38.1%
Vomit Everything	12	10.6%
Child had convulsions	17	15%
Lethargic or Unconscious	20	17.7%
Convulsing now	53	46.9%
Look or feel for stiff neck	2	1.8%

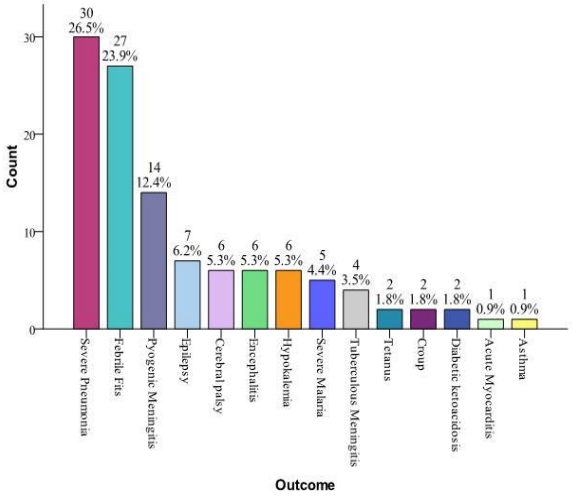

Figure No.1: Outcome of the sick children as per IMNCI n=113

Table No.3: Comparison of outcome of the sick children according to IMNCI among age groups n=113

Outcomes	Age Groups (Years)			P-value
	<12 Months n=38	12-36 Months n=54	>36 Months n=21	
Severe Pneumonia	17(44.7%)	10(18.5%)	3(14.3%)	0.007*
Febrile Fits	10(26.3%)	17(31.5%)	0(0%)	0.015*
Pyogenic Meningitis	5(13.2%)	4(7.4%)	5(23.8%)	0.151
Cerebral palsy	2(5.3%)	3(5.6%)	1(4.8%)	0.990
Diabetic ketoacidosis	0(0%)	0(0%)	2(9.5%)	0.012*
Encephalitis	1(2.6%)	3(5.6%)	2(9.5%)	0.525
Epilepsy	0(0%)	6(11.1%)	1(4.8%)	0.089
Hypokalemia	2(5.3%)	4(7.4%)	0(0%)	0.438
Severe Malaria	0(0%)	2(3.7%)	3(14.3%)	0.036*
Tuberculous Meningitis	0(0%)	3(5.6%)	1(4.8%)	0.345
Croup	0(0%)	1(1.9%)	1(4.8%)	0.413
Asthma	0(0%)	1(1.9%)	0(0%)	0.574
Acute Mycarditis	1(2.6%)	0(0%)	0(0%)	0.369

Chi-square test applied *significant

Table No.4: Comparison of outcome of the sick children according to IMNCI between groups n=113

Outcomes	Gender		P-Value
	Male (n =73)	Female (n=40)	
Pneumonia	22(30.1%)	8(20%)	0.234
Febrile Fits	20(27.4%)	7(17.5%)	0.238
Pyogenic Meningitis	8(11%)	6(15%)	0.533
Cerebral palsy	4(5.5%)	2(5%)	0.913
Diabetic ketoacidosis	0(0%)	2(5%)	0.054
Encephalitis	4(5.5%)	2(5%)	0.913
Epilepsy	4(5.5%)	3(7.5%)	0.670
Hypokalemia	3(4.1%)	3(7.5%)	0.442
Severe Malaria	1(1.4%)	4(10%)	0.033*
Tuberculous Meningitis	2(2.7%)	2(5%)	0.534
Croup	2(2.7%)	0(0%)	0.291
Asthma	1(1.4%)	0(0%)	0.457
Acute Mycarditis	0(0%)	1(2.5%)	0.175

Chi-square test applied. *significant

Outcome of the sick children as per IMNCI are presented in figure 1. Severe pneumonia was the commonest outcome that was observed in 26.5% children followed by febrile fit 23.9%, pyogenic meningitis 12.4%, epilepsy 6.2%, Cerebral palsy 5.3%, encephalitis 5.3%, hypokalemia 5.3%, severe malaria 4.4%, tuberculosis meningitis 3.5% and croup and asthma were also observed.

Rate of severe pneumonia was significantly high in below 12 months of children as compare to above 12 months of age children (p=0.007) similarly rate of febrile fits was significantly high in below 36 months of age children (p=0.015) while rate of diabetic ketoacidosis and severe malaria was significantly high in above 36 years of age children as shown in table 1. Rate of outcome was not statistically significant between male and female except rate of severe malaria was significantly high in female as compare to male (p=0.033) as presented in table 2.

DISCUSSION

Pakistan's high child and infant mortality rates are a source of concern, and urgent action is required to address the problem.[6] Despite two decades, little follow-up on IMCI program knowledge and practices, making understanding its effects crucial for healthcare professionals.

Study reveals gap in understanding IMNCI management guidelines, assessing nutritional status and acute illnesses holistically. In a study conducted in Egypt it was highlighted that correct adherence to the IMNCI guidelines is imperative in achieving significant reductions in under-five mortality.[7] Mohan P et al found similar bottlenecks in training program in their study in India.[8,9]

Khan R in his study conducted the study for trained and untrained health care professional in Pakistan also found poor knowledge of health care providers regarding respiratory issues in both trained and untrained groups.[10] For lowering morbidity and mortality, prompt diagnosis and appropriate management of the general danger signs of common childhood illnesses are essential.[9]

In present study severe pneumonia was the commonest outcome that was observed in 26.5% children followed by febrile fit 23.9%, pyogenic meningitis 12.4%, epilepsy 6.2%, cerebral plasy 5.3%, encephalitis 5.3%, hypokalemia 5.3%, severe malaria 4.4%, tuberculosis meningitis 3.5% and croup and asthma were also observed. In a local study,[5] URTIs were the principal reason for fever in children in the form of Otitis media and tonsillopharyngitis followed by LRTIs (pneumonia) with the tonsillopharyngitis was the most frequent diagnosis for high-grade fever in eight (32%) children treated by IMNCI approach and nine (36%) children treated by traditional non-IMNCI approach.

Streptococcal tonsillopharyngitis involves congested throat, pus, follicles, and enlarged cervical lymph nodes in 07 out of 08 of cases. Streptococci cause various diseases, affecting organs differently.Rheumatic fever and glomerulonephritis are possible consequence of group A beta-hemolytic streptococci infections.[11]

Less frequent causes are pneumococcal infection and other groups of β-hemolytic streptococci. Cytokines, especially tumor necrosis factor-α (TNF-α) and

interleukin-6 (IL-6) play principal part in pathogenesis of the inflammatory process of tonsillopharyngitis with positive correlations between high-grade fever and raised levels of these two cytokines.[12] The study by Factor et al. (2001)[13] aimed to ascertain whether the fever module in the WHO/UNICEF guidelines for the IMNCI recognizes febrile children with bacterial infections in an area of low malaria prevalence (Dhaka, Bangladesh),they found the majority of children with meningitis (100%) and pneumonia.

A Principal focal point of IMNCI is health system amelioration and aim of this amelioration is to enhance effectiveness of health care system.[14] IMNCI emphasizes peripheral wellbeing system significance, care standards, and local management, promoting reform and focusing on crucial modifications. The rationale for execution of IMNCI in Pakistan is increased children morbidity and mortality. Each year 700,000 children die and Pakistan's wellbeing administrators neglect children's health demands due to frequent diseases like ARI, diarrhea, and malnutrition. Almost half (43.0%) of the Pakistan population consists of children 15 years of age which account 60.0% of nationwide morbidity and one of the highest infant mortality in the territory, 84 /1000 live births.. IMNCI had been initiated in eighty nations and executed in nineteen and few indirect indicators declared its effectiveness as a complete and successful policy.[14,15] A study conducted in 2 low-income dwellings in Pakistan showed that where IMNCI strategy is executed, it modified the practices of private providers .[14]

IMNCI emphasizes standard care, society role, and local health system development, attracting feedback from Africa and low-income countries. Pakistan is one of three countries to modify the International Management of Pregnancy and Childbirth (IMNCI) to include neonatal care. Pilot testing in two districts and a masters training program are underway, requiring government and private sector commitment.[16]

To promote IMNCI benefits, it is crucial to increase awareness among policy-makers, providers, NGOs, private sector, donor society, and the public. This includes capacity building, enhancing monitoring, drug systems, supervision, and strengthening society participation. Prioritizing these aspects based on the country's situation is essential.

In our study there were 64.6% males and 35.4% females, nearly similar percentage of gender distribution was reported by Roodpeyma Sh who presented the observed that there were 39 (59%) females and 27 (41%) boys in their published work.[26] In our study, severe pneumonia was observed in 26.5% children, which is comparatively higher that the observations reported by Chaudhuri S et al that there were 15.9% of the study participants had severe pneumonia[17] while our finding was consistent with the published work reported by Arifeen SE et al who reported that 25% participants had severe pneumonia.[19] However, in our study, severe pneumonia was the most common presenting illness with 26.5%, although the most common presenting complaint reported by by Arifeen SE et al was fever (80%), followed by cough or cold (49%).[19] Contrarily, the most common complaint (25.8%) was diarrhea.[18] In our findings, hypokalemia was observed in 5.3%, in contrast, Arifeen SE et al reported that there was no evidence of diarrhea with dehydration or hypokalemia in any of the children.[19] While, Chaudhuri S et al. observed that, based on IMNCI classification, 1.9% participants were severely dehydrated.[17] In contrast, the diarrhea was reported in 19% cases by Arifeen SE et al.[19] Despite the fact that the plan has been adopted by over several nations, the impact has been mixed. The IMCI strategy was established by WHO and UNICEF to deal more effectively and efficiently with childhood diseases in the community and in primary health care institutions.[16] In observation that IMNCI approach is effective for effective triage, diagnosis, treatment referral of the young children.

CONCLUSION

The IMNCI approach is effective in early diagnosis and better outcomes for children under five years old, with pneumonia and febrile fit being common morbidity patterns. It improves care quality and counseling for mothers and caregivers.

Author's Contribution:

Concept & Design of Study:	Rahmattuh Tunio
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Revisiting Critically:	Rahmattuh Tunio, Dilijan Baloch, Vijia Kumar Gemnani
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Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Ramji S. Integrated Management of Neonatal and Childhood Illness (IMNCI): implementation challenges in India. Indian Pediatr J 2006; 43(12): 1029-3.
2. Khan RA. Knowledge of clinical case management of IMNCI among trained untrained primary health care personnel in two districts of Punjab Pakistan, Master‟s thesis, Professor PerAshorn, Health Sciences (International health) 2009:1-8.

3. Agha A, white F, Younus M, Kadir MS, Ali S, Fatmi Z. Eight key household practices of integrated management of childhood illness. J Pak Med Assoc 2007;57:288-93.
4. Nisar N. Integrated management of childhood illness and health system reforms in Pakistan. Rawa Med J 2003; 28:44-7.
5. Sallam SA, El-Mazary AM, Osman AM, Bahaa MA. Integrated Management of Childhood Illness (IMCI) Approach in management of Children with High Grade Fever ≥ 39º. International J Health SC 2016;10(2):241.
6. Tharwani ZH, Bilal W, Khan HA, Kumar P, Butt MS, Hamdana AH, et al. Infant & Child Mortality in Pakistan and its Determinants: A Review. INQUIRY: J Health Care Organization, Provision, and Financing 2023;60:00469580231167024.
7. Rakha AM, Abdulmoneium A-NM, Farhoud S, Pieche S, Cousens S, Daelmans B, et al. Does implementation of IMCI strategy have an impact on child mortality? A retrospective analysis of routine data from Egypt. BMJ Open 2013;3:
8. 11.Mohan P. Kishore B, Singh S, Bahl R, Puri A, Kumar R. Assessment of Implementation of Integrated Management of Neonatal and Childhood Illness in India. J Health Popul Nutr 2011;29: 629–38.
9. Anwar-ul-Haq H, Kumar R, Durrani SM. Recognizing the danger signs and health seeking behaviour of mothers in childhood illness in Karachi, Pakistan. Univers J Public Health 2015; 3:49–54.
10. Ahmed HM, Mitchell M, Hedt B. National implementation of Integrated Management of Childhood Illness (IMCI): policy constraints and strategies. Health Policy 2010;96:128-33
11. Bush LM, Perez MT. Streptococcal Infections. MSD MANUAL. College of Medicine, Florida Atlantic University and Perez Maria T., Wellington Regional Medical center, West Palm Beach 2019:1-20.
12. McDougall P, Harrison M. Fever and feverish illness in children under five years. Nursing Standard 2013;28:49-59.
13. Factor SH, Schillinger JA, Kalter HD, Saha S, Begum H, Hossain A, et al. Diagnosis and management of febrial children using the WHO/UNICEF gudlines for IMCI in Dhaka, Bangladesh. Bull World Health Organ 2001; 79:1096-1105.
14. Diaz T, George A, Rao S, Bangura P, Baimba J, McMahon S, et al. Healthcare seeking for diarrheas, malaria and pneumonia among children in four poor rural districts in Sierra Leone in context of free health care: results of a cross-sectional survey. BMC Public Health 2013;20: 13-157.
15. Ratwari AK, Raina N. Integrated management of childhood illness (IMCI): A robust strategy. Indian J Ped 2002;69: 41-48.
16. Luby S, Zaidi N, Rehman S, Northrup R. Improving Private practitioner sick-child case management in two urban communities in Pakistan. Trop Med Internat Health 2002;7:210.
17. Nisar N. Integrated management of childhood illness and health system reforms in Pakistan. J Pak Med Assoc 2003;28:44Á7.
18. Chaudhuri S, Dutt R, Goswami S, Benerjee P, Lahiri M. Morbidity profile of 2 months-5years children according to IMNCI classification in paediatrics outpatient department of tertiary care hospital, Joka, Kolkata, India. Int J of Research Med Sciences 2017;5(5):2202.
19. Roodpeyma Sh. Integrated Management of Childhood Illness in Outpatient Department of a University Hospital. Iranian J Pediatr Society. 2010;2(1).
20. Arifeen SE, Bryce J, Gouws E, Baqui AH, Black RE, Hoque DM, et al. Quality of care for underfives in first-level health facilities in one district of Bangladesh. Bulletin of the World Health Organization 2005;83(4):260-