

Burden of IMCI Related Co-existing Illnesses Other than Diarrhea, in 2 Months to 5 year age children admitted in a tertiary care unit: Are we realizing the magnitude of problem?

JUNAID RASHID*, M. SHAHID, M. TARIQ BHATTI, SUMAIR ANWAR, SAIRA SHAHEEN, MEMOONA JAMIL

ABSTRACT

Objective: To calculate the burden of IMCI related preventable co-morbidities other than the presenting illness in children aged 2 months-5years.

Settings: Diarrhea Section of Pediatrics Department, Jinnah Hospital, Lahore.

Duration: 2 months, July-August 2010.

Design: Prospective descriptive study included all children aged 02 months to 5 years, enrolled during the study period, and excluding children with very critical illness, short stay not enabling complete history, examination and relevant investigations or those who LAMA.

Results: Total 509 children were included, all presented with diarrhea and dehydration. 77.4% (n=394) were below 2 years, 283 (55.3%) males and 226 (44.4%) females. Anemia was found in 55.8% (n=284), rickets 19.6% (n=100), history of passage of worms 15.9% (81%), (table no. 2) and history of ear discharge 12.9% (n=65). Regarding the frequency of preventable risk factors of morbidity, lack of complete vaccination was 41.65% (n=212), frequency of breast feeding showed 18.8% (n=96) no and 30.8% (n=157) partial breast feeding, and improper weaning was 43% (n=218). 17.8 Almost 87.9% children have been to various health facilities prior to this admission, out of which % to primary health facility, 22.4% to secondary, and 47.7% to tertiary health care facility.

Conclusions: Majority children under five years of age have multiple preventable co-morbidities and risk factors for childhood illnesses including anemia, rickets, malnutrition, weaning and breast feeding problems, which are unaddressed and un-noticed.

Key words: IMCI, Co-morbidities, Disease burden, Diarrhoea.

INTRODUCTION

Examining a child as-a-whole is still a dilemma. Most under-five children presenting to any type of medical facility, primary, secondary or tertiary have a lot many associated problems that come under the domain of IMNCI e.g., malnutrition, lack of breast feeding, anemia, vitamin A deficiency, incomplete vaccinations etc. Co-morbidity is common other than the presenting complaints. Such co-morbid problems are commonly over looked and the health care providers as well as the parents are generally concerned about the presenting disease. This leads to incomplete management of the index child, leaving many pages unfolded. Such children keep on presenting to health facilities for multiple reasons thereafter which were not only preventable in the first place, rather many of these issues were manageable by simple house hold techniques if addressed in time. The reasons behind this problem are many and very obvious. Firstly most hospitals in a city like Lahore lack Preventive Pediatrics Departments to look after

the preventive aspects of Pediatrics which are pretty cost-friendly and require much less budgets than free-medicines in hospitals. Secondly, even in the clinical Pediatrics Departments majority of the post-graduate trainees, house officers and staff nurses are not IMCI trained and oriented, therefore they lack a vision of one of the most basic concept of child examination i.e. examine a child as-a-whole. Even though, if nurses are trained for detailed screening evaluation, the assessment of co-morbid conditions can be improved significantly¹. Health care providers getting IMCI training in Bangladesh showed a significant improvement in health care facilities in a particular study². Thirdly Pakistan is one of the few third world countries which have not started with pre-service IMNCI training in under graduates. Fourthly most of the general practitioners in the community lack the attitude of CME in Pediatrics, despite the fact that most of their clinical general practice is Pediatric patients, majority are not trained or concerned to examine and evaluate children as-a-whole and screen co-morbidities coming under the umbrella of IMNCI. Fifthly with the availability of good antibiotics especially third generations, oral and injectables, majority bacterial illnesses have a short-cut

Department of Paediatric, Allama Iqbal Medical College/Jinnah Hospital, Lahore

Correspondence to Dr. Junaid Rashid, Associate Professor Paediatrics email: doc_junaid@hotmail.co

treatment, rather than going into the depth of the associated risk factors. Sixthly over crowding in the out-patient and emergency sections of various larger health facilities also contribute to the lack of detailed examination and lastly, putting IMCI on the shoulders of community workers only and not involving the skilled professionals, including consultants, post graduate trainees, house officers is not wise because training at higher level is equally important, as primary, secondary and tertiary care facilities are full of children having a lot many co-morbid conditions other than the presenting complaints.

Our study was designed to highlight the load of associated preventable co-morbid problems and risk factors in children that were overlooked despite multiple visits to various health care facilities, including malnutrition, lack of breast feeding, incomplete or partial immunizations, anemia, rickets, worm infestation and otitis media. Majority of the aforementioned problems are preventive e.g. Iron deficiency anaemia affects a quarter of the world's population and the true toll of iron deficiency and anaemia lies hidden in the statistics of overall death rates and has serious effects on immunity, morbidity from infectious, physical work capacity, and cognition³.

IMCI is an integrated approach to child health that focuses on the well-being of the whole child. IMCI aims to reduce death, illness & disability and to promote improved growth and development among children under five years of age. IMCI includes both preventive and curative elements that are implemented by families and communities as well as by health facilities. Children brought for medical treatment are often found suffering from more than one morbid condition, making a single diagnosis impossible⁴. These children require a combined therapy for successful treatment. Thus, the need of the hour is an integrated strategy that combines the treatment of major childhood illnesses, with involvement of parents in provision of home-based care, prevention of disease through immunization, improved nutrition, and breast feeding⁵. This integrated strategy led to the formation of "The Integrated Management of Childhood Illness (IMCI)" in 1992 by UNICEF and WHO. It was based on the rationale that decline in child mortality rates is not necessarily dependent on the use of sophisticated and expensive technologies but rather on a holistic approach that combines the use of strategies that are cheap and can be made universally available and accessible to all⁶. An evaluation of IMCI strategy in 12 countries over the world revealed that the training of healthcare workers improved the quality of care significantly. For example, in Tanzania, IMCI was associated with a 13% reduction in under-five

mortality over a two-year period and stunting was reduced significantly⁹. In Bangladesh, the utilization of government facilities improved substantially due to its availability. This strategy has now been implemented in more than 100 countries⁷. IMNCI does not imply that the health workers will not treat individual diseases. Rather, it implies that the workers will broaden their approach to consider and respond to the child and manage the different factors that could be contributing to child's sickness. The management procedures in IMNCI involve the use of only a limited number of essential drugs in order to promote their rational use. The mother is given clear instructions on how to give oral drugs and to treat the child at home when hospital admission is either not required or is not possible. She is also directed to return for follow-up visits as per the IMNCI protocol⁸.

Pakistan is a third world country with poverty, lack of clean drinking water, poor and unequal health facilities for all. Yet different provincial governments especially Punjab is trying hard to provide free medical care including drugs, surgeries and laboratory investigations. Preventive strategies like IMCI will help a lot in decreasing the input of sick children to hospitals and therefore reduce the overall cost of health. If we only develop our skills to screen and examine all presenting children as-a-whole in all levels of health facilities we can prevent a sound bulk of morbidity and mortality. It is important to at least realize the burden and load of these preventable problems and train our medical students, house officers, post graduates and all consultants on regular basis for screening evaluation of children as-a-whole.

MATERIALS AND METHODS

This was a short duration descriptive study carried out on under-5 admitted cases in diarrhea section of Pediatrics Department Jinnah hospital Lahore, over a period of 2 months i.e. July-August 2010. All the cases who were admitted in diarrhea section during the study period, aged from 2 months to five years were included. Children who LAMA, those beyond 5 years, those with a very short stay not enabling the required history taking and investigations and critically ill were excluded. A pre-designed performa was filled for each patient after an informed consent by two study physicians only. The performa consisted of biodata, including name, age, and sex, information regarding breast feeding, weaning and vaccination status, history of otitis media, worm infestation and previous visits to health care facility. It also included the examination of the baby including anthropometric data, palmar and conjunctival pallor, edema, signs of rickets, any ear discharge, and finally the evaluation of the degree of malnutrition. Each child with palmar

pallor was put to simple lab evaluation of Hb gm%, and anemia was labeled if Hb was found less than 11 gm% which is the WHO definition for children aged 6 months to 6 years. Similarly each child with a wider wrist and open fontanella beyond 18 months was put to x-ray wrist for the confirmation of rickets, even though malnourished children did not show all signs of rickets as their bones were not growing and in many children with obvious clinical signs of rickets including Harrison sulcus, ricketary rosary, box-shaped skull, x-rays were found to be in the healing phase. Worm infestation and suppurative otitis media were only labeled with a positive history. Malnutrition was assessed according to Gomez classification, in

order to keep the assessment simple. Improper weaning was labeled if the age of weaning was later than 6 months and quantity of food taken by the baby was not age matched.

Table 1: Age & sex distribution of study

Age	Males	Females	
<1 Year	127(24.9%)	81(15.9%)	208(40.8%)
1-2 Years	96(18.9%)	90(17.7%)	186(36.5%)
2-3 Years	35(6.8%)	21(4.1%)	56(11.0%)
3-4 Years	13(2.5%)	22(4.3%)	35(6.8%)
4-5 Years	12(2.3%)	12(2.3%)	24(4.7%)
	283(55.6%)	226(44.4%)	509 (100%)

Table 2: Age distribution of cases with pallor, rickets & h/o worm passage

Age	Age wise total	Cases with pallor & age wise %age	Cases with rickets & age wise %age	Cases with h/o worm passage & age wise %age
< 1 Year	208	111 (53.3%)	34 (16.3%)	23 (11.1%)
1-2 Years	186	128 (68.8%)	58 (31.2%)	33 (17.7%)
2-3 Years	56	23 (41.1%)	03 (5.3%)	11 (19.6%)
3-4 Years	35	11 (31.4%)	04 (11.4%)	07 (20%)
4-5 Years	24	11 (45.8%)	01 (4.1%)	07 (29.1%)
Total	509	284 (55.8%)	100 (19.6%)	81 (15.9%)

Table 3: Age distribution of cases with malnutrition

Age	Age wise total	Cases with 1 st Degree MLN with age wise %age	Cases with 2 nd Degree MLN with age wise %age	Cases with 3 rd Degree MLN with age wise %age	Total cases with MLN
< 1 Year	208	51	49	44	144
1-2 Years	186	45	51	51	147
2-3 Years	56	10	20	04	34
3-4 Years	35	06	04	01	11
4-5 Years	24	08	04	06	18
Total	509	120 (23.6%)	128 (25.14%)	106 (20.8%)	354 (69.5%)

Table 4: Vaccination status of study cases

Vaccination status	=n	%age
Full or up-to-date Vaccination (EPI)	297	58.3
Partial Vaccination	131	25.7
No Vaccination	81	15.9
TOTAL	509	

Table 5: Breast feeding status of study cases

Breast feeding status	=n	%age
Exclusive	256	50.2
Partial	157	30.8
No Breast Feeding	96	18.8

RESULTS

A total of 509 cases were evaluated with detailed history, examination and selective investigations as indicated, majority bulk 394 (77.4%) were below two

years of age. 283(55.6%) were males and 226 (44.4%) females, break up of age and sex shown in table 1. The main theme of the study is very clearly reflected from the results as majority cases getting admitted with a primary complaint of loose motions and dehydration had co-morbidities like malnutrition (table no. 3), anemia (55.8%), rickets (19.6%), history of passage of worms (15.9%), (table no. 2) and history of ear discharge (12.9%). Similarly many admitted cases had issues to be addressed e.g. lack of complete vaccination (41.65%), (table no. 4), problems with breast feeding, (18.8% no and 30.8% partial breast feeding), (table no. 5) and improper weaning etc. A high percentage of malnutrition is not matching with the high percentage of breast feeding, because these children although breast fed were having poor weaning practices (43.3%) as a contributing factor. Almost 78% children have been to various health facilities of different levels prior to this

admission. If such cases are not screened for all these problems coming under the domain of IMCI, these children keep on visiting health care facilities for multiple concerns which are many a times life threatening. Almost 87.9% children have been to various health facilities prior to this admission, out of which 17% to primary health facility, 22.4% to secondary, and 47.7% to tertiary health care facility. Despite of being to tertiary care many of the study cases were either not screened or not managed for these co-morbidities.

DISCUSSION

Integrated Management of Childhood Illness (IMCI) has been adopted by over 100 countries as a strategy for reducing child mortality and improving child health and development. It includes complementary interventions designed to address the major causes of child mortality at community, health facility, and health system levels⁹. The main concept of IMCI is a strategy based on identification of simple signs & symptoms leading to classification of the gravity of illness. Although IMCI is a community plan involving health workers but its importance and implementation in tertiary care facilities cannot be ignored. Similarly lack of pre-service IMCI training for doctors, nurses and lack of in-service training of postgraduate residents and house officers leads to poor vision regarding detailed screening of cases getting exposed to them. This leads to a more 'curative' than 'preventive' approach. As Preventive Pediatrics Departments are missing in most of the Government hospitals, and are totally lacking in private setups majority children seeking health care advices from public or private medical facilities are generally ignored for the preventive aspects of examination. Therefore it is the leading responsibility of the treating institutions, departments of clinical Pediatrics and even general practitioners to identify co-morbidities like anemia, rickets, malnutrition, worm infestations and Vitamin A deficiency etc. Similarly poor cultural concepts regarding breast feeding, weaning, in-time vaccinations, oral rehydration, malarial control, hypothermia in neonates etc. all needs to be addressed in health care facilities. In a study carried out in South Africa, nurses were IMCI trained and this lead to a marked improvement in assessment of danger signs in sick children (7% before versus 72% after), assessment of co-morbidity (integrated score 5.2 versus 8.2), rational prescribing (62% versus 84%), and starting treatment in the clinic (40% versus 70%)¹⁰. Similar study carried out in Morocco revealed the significance of in-service IMCI training of health workers leading to a significant improvement in quality of care in children¹¹.

The main aim of this study was to highlight the significance of detailed screening of all children coming to a health care facility, especially tertiary care. The target population selected for this project was high risk i.e. children admitted with diarrhea, in the diarrhea section of Pediatrics Department Jinnah Hospital, Lahore during peak of diarrhea season. Similar study if done in pneumonia-season, or on outdoor children might come up with different results. Many children in this study had already been to multiple levels of health facilities and their co-morbidities were ignored due to multiple reasons.

Individual studies on single and multiple variables included in our study have been done in the past by other researches in Pakistan. In our study the burden of anemia in children aged one month to 59 months was 55.8% with maximum bulk (84% of all anemics) below 2 years of age. Another recent data from Kasur in 2008, a district in Punjab revealed anemia burden of 94% in low socio-economic class, which is extremely high.⁽¹²⁾ In the same study the number of diarrheal episodes, acute respiratory infections, worm infestation and history of fever with rigors were also significantly associated with anemia ($p=0.002$, 0.04 & 0.003) respectively. A comparative study from recent international data published in 2010 revealed an anemia burden of 75% in under-5 well children in a community health center in South Africa¹³. More than 75% of Indian toddlers are anemic.⁽¹⁴⁾ Identifying milder anemia is extremely important because treating milder anemia can reverse some of the related ill effects and may often avoid the progression to severe anemia and the dangers associated with blood transfusion.

Malnutrition was another important screening variable in our study, as 69.5% children were having some form of malnutrition, with 23.6% first degree, 25.1% second degree and 20.8% having third degree malnutrition assessed by Gomez classification. Our data is not very much different from the one carried out 13 years ago in hospitalized children of Shaikh Zayed Hospital, Lahore where 47%, 31% and 22% had 1st, 2nd and 3rd degree malnutrition respectively¹⁵. In a recent study in Karachi in 2008, low weight for age was observed in 61(78%) children while severe stunting was found in 34(43.6%) and 5(6.4%) manifested severe wasting.⁽¹⁶⁾ In another study published in 2007 screening of school going children aged 3-13 years was done and majority of children assessed for malnutrition fell in the category of mild to moderate wasting (39.72% and 31.1%) and stunting (36.1 and 28.0%)¹⁷. In a study in Peshawar among malnourished children, 20.8% had first degree, 11% had second degree and 9.5% had third degree malnutrition at 95% confidence intervals (+ - 2SD)¹⁸. In another recently published (2010) study

carried out on admitted malnourished cases in Civil Hospital, Karachi the results regarding malnutrition are alarming, where 44% patients were severely stunted, 29% had moderate stunting, 18% had mild stunting while only 10.7% had normal stature. Severely malnourished (< -3SD) were 79% while 20% patients had moderate malnutrition (-2SD to -3SD). Forty two percent severely malnourished children also had severe stunting. Anemia was the most common micronutrient deficiency seen in 78% patients, out of these 88% had iron deficiency anemia.⁽¹⁹⁾ Regarding international data in this context a recently published Turkish research, done in farmer's children reflected the nutritional status of the 168 children who participated, 38.1% were stunted, 20.8% were underweight, and 5.4% were wasted.⁽²⁰⁾ This is a clear reflection of children from different ethnic groups and risk factors having similar data of malnutrition, nationwide and worldwide. This signifies the need of constant screening of children at all levels including primary health care facilities, schools, tertiary care hospitals and communities.

Nutritional rickets continues to be a public health problem in many countries despite the presence of cheap and effective means of preventing the disease²¹. Identification of Rickets as a screening routine cannot be ignored as this apparently simple disease can have life threatening consequences like pneumonias, cardiomyopathy²². B cell and natural killer cell reduction which occur because of vitamin D deficiency may contribute to the development of pneumonia and other infections in patients with nutritional rickets.⁽²³⁾ Delayed walking, another parental concern is also a consequence of rickets.⁽²⁴⁾ In our study 19.6% had rickets with majority (92% of all rickets) falling below 2 years. While frequency of rickets in total admitted cases in 3 years was found to be 2.25% in a study in Peshawar²⁵. In the above-mentioned study of civil hospital Karachi, Rickets was found in 36% patients⁽¹⁵⁾ In another study carried out in Turkey 6.8% children admitted over a period of 3 years were having nutritional rickets. The above mentioned figures are diverse because the etiology of nutritional rickets is multifactorial. A research reflected that factors related to vitamin-D deficiency rickets in children are 6-11 months age, male sex, prematurity, drinking unfortified animal milk, delayed weaning, lack of sun exposure and absence of dietary supplementation with vitamin-D²⁶.

Vaccination status of our study cases reflected a full EPI vaccination in 58.3%, partial or incomplete (not up-to-date) in 25.7% and no vaccination in 15.9% cases. Similarly breast feeding status reflected that 50.2% cases were exclusively breast fed, 30.8% were having top feed along with breast feeding, while 18.8% children never had breast feeding. Malnutrition

(68%) despite having breast feeding was another point of order to be noted in this data. In these malnourished cases other factors like poor weaning (43.3%) also contributed. Worm infestation, an important contributor to anemia and a noticeable component of IMCI, was 15.9% in our study. In a recent (2007) study in Peshawar 70% of the urban and 83.33% of the rural women breast-fed their infants, mixed breast-feeding and bottle-feeding was recorded in (urban 22.5%, rural 11.67%), while bottle-feeding was recorded in (urban 7.5%, rural 5%) cases²⁷.

The concept of highlighting all this data in recent perspective is to realize the magnitude of work that is still required to fulfill MDG 04. The task is apparently too tough, and needs an extreme commitment and co-ordination among health care providers at all levels nation wide. To compensate for the paucity of preventive Departments, we the clinicians have to join hands with the community health organizers in order to screen the discrepancies going on in the community in under-five children. It seems enthusiastic but IMCI corners can be established in all tertiary care hospitals under the auspicious of Pediatric Departments with trained health workers, in order to screen all children presenting with different presenting problems to the hospital outpatients. The said corners can be monitored by IMCI trained post graduate trainees in general Pediatrics on rotation basis with IMCI trained health workers and nurses as the key examiners. These corners will only address co-morbidities like anemia, malnutrition, rickets, worm infestation, Vitamin A deficiency etc because severe illnesses coming to tertiary care are already catered pretty well. Similarly these corners will also be having, breast feeding counselors, weaning advisors and vaccination advisors who could analyze and manage these contributing risk factors of childhood illness. We know poverty and illiteracy are a limiting factor in child survival programmes, yet lack of awareness about risk factors of childhood illness is repairable.

CONCLUSIONS

Majority children under five years of age presenting to any type of health facility have multiple preventable co-morbidities and risk factors for childhood illnesses including anemia, rickets, malnutrition, weaning and breast feeding problems, which are unaddressed and un-noticed. Tertiary care units need to contribute in IMCI based clinical management. Pre-Service IMCI training should be immediately started in Medical Colleges in Pakistan. MDG IV cannot be achieved without a combined effort by tertiary care Pediatric units and community workers.

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