Research Article

Comparison between standardized approach versus traditional approach in management of fever in children less than five years

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Abstract
Background: Fever is one of the most frequently encountered pediatric problems, accounting for ٢٥٪ of visits to pediatric emergency room. The vast majority of young children with fever have an infectious etiology, like cold, upper respiratory tract infections (ear infection, croup, bronchiolitis and pneumonia), gastroenteritis and UTI, but there are also other important causes of fever in childhood as immunization reaction, collagen vascular disease, chronic inflammatory disease, metabolic disease, transfusion reaction, drug fever, or poisoning. Fever in young children usually indicates an underlying infection and it can be a diagnostic challenge because it is often difficult to identify the cause as in most cases the acute illness is due to self – limiting viral infection however, fever may also be the presenting feature of serious bacterial infections such as meningitis or severe pneumonia. **Objective:** This study was aimed to compare between two different approaches; the standardized approach of IMCI versus the tradional approach in management of fever in children less than five years old. **Methods:** This is a prospective study carried out on ٥٠ children less than five years old represented with fever attended the out patient clinic of Minia university hospital for children during the period from September ٢٠١٢ to January ٢٠١٤. These ٥٠ children were divided into ٢ main groups: Group ١: Included ٢٥ children subjected to standardized (IMCI) approach of management which designed with limited diagnostic tools , limited medications and opportunities to practice complicated clinical procedures to reach a classification rather than diagnosis, and group II: Included ٢٥ children subjected to traditional approach of management which designed to use serial investigations and procedures with many medications to reach a diagnosis. **Results:** Most of children in standardized approach (٦٤٪) were diagnosed at ١st day, while most of children in traditional approach were diagnosed at ٤th (٣٤٪) or ٥th day (٢٠٪), these differences were statistically significant, and ٦٠٪ of children treated with the standard approach was improved compared to only ١٢٪ of children treated with traditional approach, ٤٠٪ of treated with traditional approach had worse outcome compared to ١٦٪ of treated with the standard approach and these differences were statistically significant. **Conclusions:** This study showed that the standardized approach of IMCI designed to reach a classification and\or a diagnosis earlier with much better outcome than the traditional approach in majority of cases which is better for practical applications especially in developing countries.
Key Words: Fever, IMCI, Standardized approach, Traditional approach, Children under five.

Introduction
Although fever is one of the most common presenting complaints to emergency department, the approach to the febrile child remains controversial, despite attemps to simplify and unify the approach to febrile children, the evaluation and treatment of these patients varies considerably.

Furthermore, recent advances such as vaccination with the heptavalent pneumococcal conjugate vaccine, still the need to reevaluate previously used strategies in the evaluation of child who has fever.[١]

With amplification of medical information as regard all clinical presentations we should depend on evidence based medicine (E.B.M) which aims to apply the best available evidence gained from the scientific method to medical decision making, it seeks to assess the quality of evidence of the risks and benefits of management.[٢]

The WHO/UNICCF guidelines for integrated management of child hood Illness (IMCI) offer simple and effective methods to prevent and manage the leading causes of serious illness and mortality in young children.[٢]

The clinical guidelines promotes evidence based assessment and treatment using a syndromic approach that support the rational, effective and affordable use of drugs, thus considered as the standardized approach.[٣]

The guidelines include methods for checking a child's immunization and nutrition status. The approach is designed for use in outpatient clinical settings with limited diagnostic tools, limited medication and limited opportunities to practice complicated clinical procedure.[٤]

The core of the IMCI strategy is integrated case management of the most common childhood problems, with a focus on the most important causes of death, When assessing a sick child, a combination of individual signs leads to one or more classifications, rather than to a diagnosis.[٤]

IMCI classifications are action oriented and allow health care providers to determine if a child should be urgently referred to another health facility, if the child can be treated at the first level facility, or if the child can be safely managed at home.[٢]

Patients and Methods

This is a prospective study carried out on ٥٠ children less than five years old represented
with fever attended the out patient clinic of Minia university hospital for children during the period from September ٢٠١٢ to January ٢٠١٤.

These ٥٠ children were ٢٨ males and ٢٢ females and they were divided into ٢ main groups: Group I: Included ٢٥ children subjected to standardized (IMCI) approach of management which designed with limited diagnostic tools, limited medications and opportunities to practice complicated clinical procedures to reach a classification rather than diagnosis and group II: Included ٢٥ children subjected to traditional approach of management which designed to use serial investigations and procedures with many medications to reach a diag-nosis. All children subjected to: Complete history takink, through clinical exami-nation, only those of group ٢ were subjected to: Complete blood count (CBC) using SYSMAX-KX-٢١N, JAPAN, ESR using Wsetergreen method, CRP using fully automated chemical auto-analyzer Dimension – ES, USA, urine and stool analysis and some children in this group subjected to (according to the case): Chest x-ray when pneumonia was suspected, lumbar puncture and CSF analysis when meningitis was suspected.

Statistical Analysis

Values are presented as mean ± SD, range, or as the number of subjects and proportions. The Student t test was used for group comparisons of normally distributed variables, and the Mann-Whitney U test and Wilcoxon signed-rank test were used for comparisons of variables with skewed distribution. The chi square test was used to compare proportions. Correlation coefficients were used to describe associations between variables, and multiple regression analysis was used to detect any relationships between the variables. Analyses were performed using the SPSS software package (SPSS V ٨.٠ for Windows).

Results

Table (١): Time to diagnosis in the studied approaches

Time to diagnosis	Standard approach (N= ٢٥)	Traditional approach (N=٢٥)	P-value
١st day	١٦(٦٤٪)	٢(٨٪)	٠.٠٢*
٢nd day	٧(٢٨٪)	٣(١٢٪)	٠.١٥
٣rd day	٢(٨٪)	٦(٢٤٪)	٠.١٢
٤th day	٠	٩(٣٦٪)	٠.٠٠٠٨**
٥th day	٠	٥(٢٠٪)	٠.٠١*

Significant difference** ****Highly Significant

Table (٢): Outcome of treatment in the studied approaches

Outcome	Standard approach (N= ٢٥)	Traditional approach (N=٢٥)	P-value
Improved	١٥(٦٠٪)	٣(١٢٪)	٠.٠٠٠٣**
The same	٦(٢٤٪)	١٢(٤٨٪)	٠.٢٢
Worse	٤(١٦٪)	١٠(٤٠٪)	٠.٠١*

significant difference** * Highly significant***

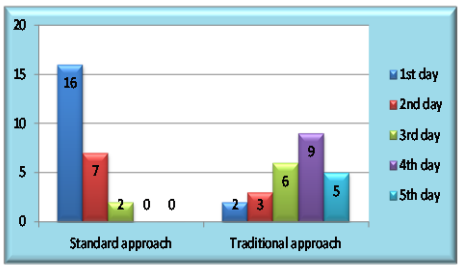

Fig. (١): Distribution of time to diagnosis in the studied approaches

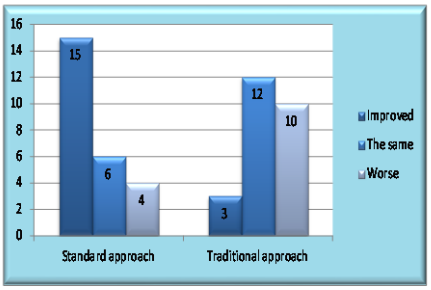

Fig. (٢): Distribution of outcome of treatment in the studied approaches

Regarding time to diagnosis in the studied approaches (Table ١), most of children in standard approach (٦٤٪) were diagnosed at ١st day, while most of children in traditional approach were diagnosed at ٤th (٣٤٪) or ٥th day (٢٠٪), these differences were statistically significant. Regarding outcome of treatment in the studied approaches (Table ٢), ٦٠٪ of children treated with the standard approach was improved compared to only ١٢٪ of children treated with traditional approach, ٤٠٪ of treated with traditional approach had worse outcome compared to ١٦٪ of treated with the standard approach and these differences were statistically significant.

Discussion

Fever is the primary presentation for a host of childhood illnesses, and its underlying cause is generally benign. Fever may have a beneficial effect in terms of fighting infection, although its value in the recovery process is far from clear, since in vivo data are largely lacking.[٥]

As a part of the child survival strategy, WHO and UNICEF, in (١٩٩٩)[٦] initiated the Integrated Management of Childhood Illnesses (IMCI) to assist developing countries to reduce childhood mortality caused by most childhood killer diseases – diarrhea, acute respiratory infections, malaria, measles and malnutrition[٣]. IMCI provides an efficient approach that is likely to have a higher impact in reducing childhood mortality compared with previous vertical disease– specific programs.[٧]

Fever is part of the assessment steps on the IMCI algorithms. A history of fever or presence of fever by palpation or measured temperature is required as a reason for the assessment of fever, which will lead to specific classifications that are linked to treatment protocols.[٦]

In health facilities, the IMCI strategy promotes the accurate identification of childhood illness in the outpatient settings, ensures appropriate combined treatment of all major illnesses, strengthens the counselling of caretakers and the provision of preventive services, and speeds up the referral of severely ill children. The strategy also aims to improve the quality of care of sick children at the referral level. It also creates a scientifically sound link between the management guidelines at the comm.-unity level and the management approach in

a referral centre. The strategy also envisages actual situations when referral is not possible and offers the best possible options in such circumstances[٨]
The IMCI clearly offers several benefits to children in areas where it is implemented. IMCI improves health-worker performance and leads to better quality of care and rational drug use at costs that are lower or similar to investments in routine child health services[٩]

Therefore, in the present study, fifty children less than ٥ years old, presented with fever, were enrolled for management using integrated standard approach or traditional approach.

Pharyngotonsillitis was the most common cause of fever in ٨(٣٢٪) of children managed by standard approach and ٩(٣٦٪) of children managed by traditional approach (٣٤٪ of all children).

It is well known that although most cases of pharyngotonsillitis are caused by viral agents, group A- β-haemolytic streptococci (GABHS) are the most common bacterial cause. Less common causes arepneumo-cocci and other groups of β hemolytic streptococci. Cytokines, particularly inter-leukin-٦ (IL-٦) and tumor necrosis factor-α (TNF-α), play an important role in the pathogenesis of the inflammatory process of tonsillopharyngitis. High fever correlates with high levels of these two cytokines.[١٠]

The study by Factor et al., (٢٠٠١)[١١] aimed to determine whether the fever module in the WHO/UNICEF guidelines for the IMCI identifies febrile children with bacterial infections in an area of low malaria prevalence (Dhaka, Bangladesh). They did not include pharyngitis or pharyngo-tonsillitis as a bacterial infection in their study, although this condition may be a bacterial infection. Those authors found the majority of children with meningitis (١٠٠٪), pneumonia (٩٥٪), otitis media (٩٥٪) and urinary tract infection (٨٣٪); and ٥٠٪ or less of children with bacteria-emia (٥٠٪), dysentery (٤٨٪), and skin infections (٣٠٪).

In the present study, pneumonia was the second most common cause of fever in ٧(٢٨٪) of children managed by standard approach and ٨(٣٢٪) of children managed by traditional approach (٣٠٪ of all children).

In developing countries, the causes and patterns of pneumonias are affected by malnutrition, poor housing, lack of early medical attention, and immunization. Pneumococci, streptococci, coliforms, H. influenzae and staphylococci are the more common causes of pneumonia with high mortality.[١٠]

The recent study by Kalyango et al., (٢٠١٣)[١٢] found that IMCI of malaria and pneumonia increases prompt and appro-priate treatment for pneumonia symptoms in children under five years in Eastern Uganda.

The IMCI guidelines, which community health workers (CHWs) use to make classifications, define pneumonia as cough or difficult breathing and fast breathing. The classification of fast breathing is based on age-specific thresholds of breath counts which could not be ascertained based on the caregiver reports. It was not possible to take the baseline assessments of respiratory rates in the children because they were located on day one of treatment-seeking and for some of the children the illness may have changed by the time they were seen. In addition, the CHWs records could not be used for classification of pneumonia because in the control arm, the CHWs do not assess and classify pneumonia symptoms. They had no record of which children had presented with pneumonia symptoms.[١٢]

The study by Masanja et al., (٢٠٠٥)[١٣] in Tanzania and the study by El-Arifeen et al., (٢٠٠٩)[١٤] in Bangladesh showed that with application of IMCI, equity differentials for stunting, measles immunization, treatment of fever with antimalarial drugs, and exclusive breastfeeding for children under six months were found to improve

significantly for children living in IMCI districts compared to control districts.

Earlier findings from the study by El Arifeen et al., (٢٠٠٥)[١٥] in Bangladesh found that within ٢ years of IMCI implementation, ١٩٪ of sick children in IMCI regions were taken to a health care worker (HCW), compared to ٩٪ of sick children in non-IMCI regions. Accor-dingly, use of health care facilities increased from ٠.٦ visits to ١.٩ visits per child per year.

In addition to these findings, other studies in literature showed that application of IMCI was associated with improvements in prescription accuracy, treatment, and health service quality of pediatric care. Despite we did not concern with evaluation of this parameter in the present study, it is important to highlight this benefit of IMCI.

The study by Gouws et al., (٢٠٠٤)[١٦] evaluating care at first-level health facilities in Brazil, Uganda, and Tanzania found that children receiving care from health workers trained in IMCI were significantly more likely to receive correct prescriptions for antimicrobial drugs, receive the first dose of the drug before leaving the health facility, and receive advice on how to administer the drug at home.

The study by Bishai et al., (٢٠٠٨)[١٧] in Uganda found that training of one HCW in IMCI increased service quality by ٤٤٪ per facility (as measured by the WHO-index of integrated child assessment).

The study by Amaral et al., (٢٠٠٤)[١٨] in Northeast Brazil, found that HCWs trained in IMCI were found to perform better in assessment of children, classification of disease, and communication with caregivers.

Another study by Chopra et al., (٢٠٠٥)[١٩] in South Africa found improvements in assessment of danger signs in sick children, rational prescribing, and initiation of treatment in the clinic following IMCI introduction.

In the present study, there were no cases of mortality in both approaches of management. Studies observing IMCI impact on mortality have been less conclusive than those observing morbidity and health care service quality changes. The early study by Armstrong-Schellenberg et al., (٢٠٠٤)[٢٠] found that within two years of implementtation in Tanzania, nearly ٤ fewer deaths were reported per ١٠٠٠ child/years, comprising a ١٣٪ reduction in childhood mortality.

The recent study from Egypt by Rakha et al., (٢٠١٣)[٢١] showed that IMCI implementation was associated with a doubling in the annual rate of under-five mortality reduction (٣.٣٪ vs ٦.٣٪). This mortality impact is plausible, since substantial improvements occurred in quality of care provided to sick children in health facilities implementing IMCI. Therefore, further prospective studies are needed in order to clarify the true impact of IMCI on child mortality.

Conclusions

This study showed that the standardized approach of IMCI designed to reach a classification and\or a diagnosis earlier with much better outcome than the traditional approach in majority of cases which is better for practical applications especially in developing countries like our country.

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