# CLINICAL UNDERSTANDING OF A LIFE-THREATENING ASTHMA HELP TO IMPROVE PEDIATRIC PATIENT'S OUTCOMES

**An Article Review by Dr. Alain Kabongo, South Africa**
*MBBS, MMSc( Ped. Emergency) Student of Texila American University*
Email:- alainkabongo2001@yahoo.fr

## SOURCE

Hon KL1, Tang2 WS, Leung TF1, Cheung KL1, Ng PC1(2010) Outcome of children with life-threatening asthma necessitating pediatric intensive care. Ital J Pediatr. 36:47. PMCID: PMC2916013.[Online].doi:10.1186/1824-7288-36-47. Available at http://www.ncbi.nlm.nih.gov/pubmed/20604944

## KEYWORDS

Asthma, Breathing, Pediatric, Intensive Care, Clinical Data, Children

## REVIEW OF LITERATURE

This part of the article should give a state of research on the topic. It should demonstrate opinions on previous studies, current research, and should describe the outstanding lines related to the topic. I did not see any organization around the research question developed in this study. Areas of controversies are well identified and formulated, and there is not suggestion for further studies while acute asthma in children remains a challenging health problem that need more investigations for appropriate management in terms of reducing hospital admission, mortality rate and improve the quality of life.

Clinical data regarding patterns of children suffering from life-threatening asthma (LTA) warranting pediatric intensive care is important for understanding disease severity patterns and its impacts. The literature cited in the study shows some signs of excessive referencing. For example, the study by (Hon& Nelson, 2006) is mentioned unnecessarily as the context does not warrant this. The argument, for which study by (Stein, Canny, Bohn, Reisman, &Levison, 1989)

is mentioned, is adequately presented in other references given for that particular argument. Therefore, this reference could have been skipped. These two aforementioned citations do not contribute to the theoretical or methodological concept of the topic. Some of the references are interesting; hence, they support the discussion of findings and other theories as well.

Literature regarding similar studies on life-threatening asthma in pediatric patients has not been cited adequately and the literature review is short. The clinical data, especially in table 1, warrants a comparison with the previous findings in similar studies, but this comparison has not been provided in sufficient details. The findings that can have serious consequences to future decision making regarding life threatening asthma are not highlighted satisfactorily. Despite these factors, this article adds critical and more information to the existing literature regarding pediatric patients who have particular type of acute worsening of asthma, called status asthmatics', which does not respond to initial treatments.

## INTRODUCTION

In this article review, I will outline and discuss in different paragraphs, significance of the article, whether this fit to the existing literature; its accuracy, article structure, its objectivity, and we will briefly analyzed different figures and tabulations by reporting types of analysis performed, and I will assess whether the author's analysis support reasoning and claims. I will examine whether the analysis support the main findings in this study. I will suggest new information, methodology and other approaches that might bring contributions to the scope or the principal idea of this work. I will compare ideas in this study with other's opinions, of course related to the topic.

I will discuss how the same topic is assessed by others. I will point out effects of the author's reflexion that has not been addressed in the present paper. I will examine the journal for reliability or connection between ideas. I will suggest how to improve the scope of this study with further investigations. I will discuss what need to be examined on the topic. I will extend the writer's attempts to connect ideas with my own reflexion.

I will show my agreement with the author's ideas and explain why they comply with my knowledge. I will support aspects of the journal' claims, analysis, and I will withdraw my support in relation to other opinions, by revealing lack of convincing lines. I will add more analytical terms to analysis of topics not considered and I will finally suggest new way of reasoning.

## ARTICLE SUMMARY

Since severe asthma in children is a frequent reason for admission to pediatric intensive care unit (PICU), this retrospective study was aimed at reporting the clinical pattern of children being admitted to PICU in a tertiary care hospital, due to LTA and severe bronchospasm. The medical records were analyzed for children admitted to PICU with LTA over a period of 7 years and 8 months. It was found that there were only 30 admissions with LTA. This number accounted for only 3 per cent of total PICU admissions.

Many of the admitted children were toddlers, representing an average age of 3.1 years. 50% have had previous history of admission due to asthma, 25% had history of poor compliance to chronic medication of asthma as usually prescribed. Some of the patients had a background of prematurity, lung and neuro developmental diseases, parainfluenza, and rhinovirus infections. So, by comparison with non-ventilated patients, those who were mechanically ventilated had a significant PIM2 score (Pediatric index of mortality 2 score) representing these values: 1.65 vs 0.4, $p < 0.001$, however increased pCO2 levels (9.3 vs 5.1, $p = 0.01$).

The majority of patients receive conventional treatment, including steroids and bronchodilators according to available guidelines and the outcome was good. Regardless of the ventilation status, all patients had brief PICU stays; they improved significantly and were discharge from the PCU after an average of 2.5 days.

## ARTICLE STRUCTURE

The article, we have reviewed has a particular structure's map. Otherwise, it has made sufficient knowledge, and adding other new findings. The conceptual framework has a lack of more information. This article is structured with the following subheadings; abstract, introduction, methods, results, discussion, and conclusion. A sample size is not given in methodology, but a number of 30 admissions are recorded in the findings, this is confusing, meaning that we can consider the admission to be called sample size. In my opinion and according to the international research methods, methodology chapter should state the design used in the paper, population, sampling procedures and sample size, data collection and analysis procedures. However, in the article entitled "Outcome of Children with Life-Threatening Asthma Necessitating Pediatric Intensive Care, we do not know which software was used to store, i.e. helped for data analysis and that generated different tables, So the author has only stated that Mann Whitney U test and $\chi 2$ or Fisher exact test were performed to compare the data.

The Contents are not presented in an engaging manner and the reader has to sift through the manuscript to get the relevant and useful information. The significant findings are not properly

highlighted. Table 1 shows a good summary of the clinical data, but the percentage of male children is mentioned as zero in the table 1. This appears to be a typographical mistake, which should have been corrected while formatting of the paper. The correct total percentage of male is 43 or 44 per cent. Overall, this article has a poor structure, which needs further improvement. In text, citing of sources is well done using Vancouver style

## ARTICLE CRITIQUE

### AUTHORITY

Kam-Lun Hon is the principal author, who collaborated with Wing-Sum Winnie Tang, Ting-Fan Leung, Kam-Lau Cheung, and Pak-Cheung Ng. He is a physician holding numerous post-graduate degrees include MD and he is a professor with good academic credentials at the Chinese university of Hong Kong. Dr Kam-Lun Hon is more involved in different field of research related to children diseases. He has published more than 30 scientific articles and his last publication was in 2013. The journal where this article was published is the official journal of the Italian society for pediatrics, existing since 1975; it is accounted among the prestigious scientific journal for reliable publications.

### ACCURACY

Analysis of the clinical data is presented accurately and objectively. Relevant risk factors were presented along with treatments given at pediatric intensive care unit (PCU). The outcomes described and presented in the article are precise, and highlight all the necessary aspects of the study. There is a small sample size of patients, and the likelihood of type II error in different parameters limits the effectiveness of this study. It must be noted, however, that the objective of this paper is to report the clinical data and infer any patterns therein, so the information provided appears accurate and specific to the topic.

### PERIOD

It is challenging to confirm that whether an article is new or old. In science, particularly in medicine, a new article is a progression of previous studies; this could be a response to scientific suggestions or just an implementation of recommendations. The research was retrospective based on the patient's records registered between the period of October 2002 and May 2010, the month is not specified. The article was published in 2010, probably in the next months after the completion of the research. Therefore, we can confirm that the article is four years old and still useful for academics and medical practitioner as a reference tool.

### RELEVANCY

Since the aim of the study was to observe the clinical pattern (not just the outcome), so the contents are relevant to the topic to certain extent. The title itself is, however, incomplete in representing the study. The word "outcome" mentioned in the title represents a part of the whole study or the whole clinical pattern. If the contents of the article are seen critically, it is observed that necessary reference to previous literature is missing in the background of the paper. The results and the discussion section, however, provide relevant and sufficient information regarding the data analysed and presented in this paper.

### OBJECTIVITY

This paper reports the clinical pattern of certain LTA pediatric patients. The discussion on the findings is appropriate. Overall, information in this article is developed objectively, but since the paper does not indicate any blinding of the data collector, so there may be some biasness involved. One might argue that this is a clinical report and since there is no prior hypothesis described, so blinding was not needed. Another positive point that indicates the objectivity of the information is the fact that decision for PICU admissions was made based on multiple factors including parameters like blood gas and pulse oximetry.

### STABILITY

This article entitled "Outcome of children with life-threatening asthma necessitating pediatric intensive care" is still the only new to be displayed among the other, this, on scientific website; MEDLINE, COCHRANE. For now, I can conclude that this article may be stable at this moment regarding its publication year, unfortunately could not find reviews on this specific topic.

## ANALYSIS OF GRAPH/IMAGE/TABLE

The first table (1) describe "Clinical data of children with status asthmaticus admitted to PICU". This table presenting numerical data is well illustrated. Its interpretation is reported in the results' section, in my opinion to make reading easier and comprehensible, a clear and short interpretation should be under the table. I do agree that findings displayed in tables may be assessed in the discussion section.

In the first section of table 1, there is not subheading, however, hence three variables are not well defined, it is unclear to understand whether they represent the demographic profile of participants such as "Male %; Median age (IQR), yr and Median (IQR) PIM2, %." In the section of treatment at PCU, Systemic CS (%) does not have a p Value recorded and the reason is not given, the only note is "not applicable (N/A)". The second table presenting "The incidence of PICU admissions for LTA during the study period" is well done, representing year in ascending order, its interpretation is short and clear.

## RECENT ADVANCES RELATED TO THE TOPIC

Acute asthma, i.e. status asthmaticus is pediatric an emergency that needs urgent medical attention, good assessment, and guided management. Admission to pediatric intensive care unit should comply with certain criteria, such as history of respiratory support, stridor, decreased level of consciousness, respiratory failure, and failure of routine management to wean bronchospasm.

In a review of literature entitled "Management of status asthmaticus in children" conducted by Koninckx M and colleagues (2013), the suggestion is that the initial treatment for PSA (pediatric status epilepticus) should be oxygen therapy, rapid 2 agonist, given repetitively, aerolised anticholinergic in combination with steroids and magnesium sulfate intravenously. Additional therapy can be useful as well, such as epinephrine, heliox, inhalational anaesthetics, non-invasive respiratory support, ketamine, and mechanical ventilation. In another retrospective study, conducted in PCU at tertiary hospital in India, data collected from 2006 to 2010, including 33 children admitted children showed a minimal morbidity and mortality rate in children with severe asthma who are given an optimal treatment consisting of aerolised bronchodilator and intravenous steroids.

In recent studies, severe asthma in children had notorious attention from researches; all of them suggest the same conclusion that children should be assessed objectively and the management plan should follow guidelines. In a trial conducted by Bigham MT (2008), aimed to compare the effectiveness Helium/oxygen-driven albuterol aerolised in the management of children with status asthmaticus, demonstrated that some of the kits of management have poor outcome, however, they do not reduce the hospital's length of stay. McDowell KM and colleagues (1998) suggest that intensive care and the management following good guidelines improve the outcome of children with status asthmaticus and reduce length of stay. There have been numerous researches conducted in terms of overcoming the challenges of acute asthma, reducing the length of hospital stay and PCU admission and decrease mortality rate.

## CONCLUSION

This article, titled "Outcome of Children with Life-Threatening Asthma Necessitating Pediatric Intensive Care" has presented the outcomes and clinical patterns of pediatric patients with status asthmaticus necessitating pediatric intensive care in adequate length. Despite the sample size (number of 30 patients) which is small, and the mixing of results, the appearance is that the outcome of children with acute asthma, admitted to pediatric intensive care unit is good. However the results are not limited, but converge to the same conclusion reported by other studies and previous. The structural process of the article should be organized and clear. This article has shown some indication of excessive referencing.

It is suggested that unnecessary citations should be skipped and repetition of arguments should be avoided. The typographical error in table 1 also reduces its overall quality of the paper. Attention should also be made on the interpretation. Important findings should be highlighted in a way that it is easier for the reader to find what information is more important and relevant to the topic than the other. Sufficient referencing to the previous findings of similar studies has not been made. It should be noted that despite different caveats, this study is important in increasing clinical understanding of a life-threatening condition.

## REFERENCE

1) Belessis Y, Dixon S, Thomsen A, Duffy B, Rawlinson W, Henry R, et al. (2004) 'Risk factors for an intensive care unit admission in children with asthma.' Pediatric pulmonology. 37:201–9.

2) Bigham MT, Jacobs BR, Monaco MA, Brilli RJ, Wells D, Conway EM, Pettinichi S, Wheeler DS. (2010). 'Helium/oxygen-driven albuterol nebulization in the management of children with status asthmaticus: a randomized, placebo-controlled trial. Pediatric critical care medicine.Randomized Controlled Trial; Research Support, Non-U.S. Gov't Vol 11, no 3; 356-61.[Online]. Found at: http://onlinelibrary.wiley.com/o/cochrane/clcentral/articles/769/CN-00761769/frame.html (Accessed on 26/02/2014).

3) Carroll CL, Sala KA, Zucker AR, Schramm CM. (2012). Beta-adrenergic receptor polymorphisms associated with length of ICU stay in pediatric status asthmaticus. Pediatric Pulmonology. 47:233–9.

4) Chipps BE, Murphy KR. (2005) 'Assessment and treatment of acute asthma in children.' J Pediatr . 147:288–94.

5) Hartman ME, Linde-Zwirble WT, Angus DC, Watson RS.(2010)' Trends in admissions for pediatric status asthmaticus in New Jersey over a 15-year period.' Pediatrics. 126:e904–11.

6) Hon, K. L., & Nelson, E. A. (2006).Gender disparity in paediatric hospital admissions. Annals of the Academy of Medicine Singapore, 35(12), 882-888.

7) Koninckx M, et al. Management of status asthmaticus in children. Paediatr.Respir.Rev. (2013). Found at: http://dx.doi.org/10.1016/j.prrv Accessed on 20/01/2014

8) Malmstrom K, Kaila M, Korhonen K, Dunder T, Nermes M, Klaukka T, et al. (2001) 'Mechanical ventilation in children with severe asthma.' Pediatric pulmonology .31:405–11.

9) McDowell KM, Chatburn RL, Myers TR, O'Riordan MA, Kercsmar CM. (1998). 'A cost-saving algorithm for children hospitalized for status asthmaticus. Clinical Trial; Controlled Clinical Trial; Journal Article.Vol 152, 10: 977-84. [Online]. Found at: http://onlinelibrary.wiley.com/o/cochrane/clcentral/articles/088/CN-00156088/frame.html (Accessed on 26/01/2014).

10) Stein, R., Canny, G. J., Bohn, D. J., Reisman, J. J., &Levison, H. (1989). Severe acute asthma in a pediatric intensive care unit: six years' experience. Pediatrics, 83(6), 1023-1028.

11) SUDHANSHU GROVER, ARUN BANSAL (2010) Acute severe asthma in an Indian PICU Department of Pediatrics, Advanced Pediatric Centre, Postgraduate Institute of Medical Education and Research, Chandigarh, India. [Online] Found at: http:// www.iapindia.org/files/ABSTRACTS/.../SUDHANSHU%20GROVER.do. Accessed on 21/ 01/ 2014

12) Wang XF, Hong JG. (2001) 'Management of severe asthma exacerbation in children.'World J Pediatr. 7:293–301.