

## USING NON-STEROIDAL ANTI-INFLAMMATORY DRUGS AND ITS RISKS IN CHILDREN WITH CHICKEN POX: THE MEASUREMENT OF KNOWLEDGE AND PERCEPTION OF PARENTS

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Article Received on 12/01/2020

Article Revised on 03/02/2020

Article Accepted on 24/02/2020

### ABSTRACT

Chicken pox is a common childhood infection. Children initially present with fever followed by a vesicular rash after 2 to 3 days. Nonsteroidal anti-inflammatory medications (NSAIDs) like Nurofen or Ibuprofen are commonly available over the counter antipyretic medications and are used initially in the management of fever by parents. This study aimed to measure the knowledge and understanding of parents about using NSAIDs during chicken pox infection and its related health risks. The study aimed to conduct a qualitative cross-sectional survey by undertaking semi-structured interviews with open-ended questionnaire with 50 randomly selected parents whose children were diagnosed with chicken pox infection over a 6 month period, within the primary health care setting. The main objective was to find out if parents were aware of the associated risks of NSAIDs use. A short literature review was conducted to gain further evidence about the use of NSAIDs medication in children diagnosed with chicken pox infection detailing the associated health risks and complications. Out of the total 50 parents interviewed, none were aware of NSAID associated risks during a chicken pox illness. 8(40%) of parents used both paracetamol as well as ibuprofen as the initial antipyretic medication, whilst 12 (60%) of parents used paracetamol alone. From the current study, it can be concluded that there was a clear lack of understanding of the parents about the choice of antipyretic medication in the management of fever in chicken pox infection. None of the parents were aware of the associated risks of skin infection and necrotising fasciitis with NSAID use. Hence, there is need to develop parental educational programs to improve their understanding in the management of fever during chicken pox illness.

**KEYWORDS:** Parent perception, chicken pox, NSAIDs.

### INTRODUCTION

According to the Centre of Disease Control and Prevention (CDC – 2019), chicken pox is a contagious disease. It is a viral disease caused by varicella-zoster virus (VZV). It leads to the development of itchy and blister-like rash. The rash generally appears over the chest, back of the body and face and then spreads throughout the body. The average incubation period of chicken pox post exposure from the virus is 2 to 3 weeks. Children, adolescents, pregnant women and young adults and people who are immune-compromised are vulnerable to be infected with this painful viral infection. The best-way to prevent chicken pox is vaccination with chicken pox vaccine.<sup>[1]</sup>

In the United Kingdom (UK), chicken pox is common during childhood. Approximately three-quarters of the

parents report the history of chicken pox in their children who are below the age of 5 years.<sup>[2]</sup> According to Walker et al. (2017), the age specific consultation rate of chicken pox among various ethnic groups in UK highlights that the highest reported cases of chicken pox are below 6 years of age.<sup>[3]</sup> CDC reported that this highly contagious disease affects 80% of the population by age in the USA, Japan, UK and the main victims are below 10 years. In India and in South East Asia, the conditions are different; the main victims include people between 20 to 30 years.<sup>[1]</sup>

Boyd et al. (2017) reported although the mortality rate of chicken pox is low among children, the rate of incidence of chicken pox is high along with high morbidity in the USA and UK. UK encounters 25 deaths per year and the USA encounters 150 deaths per year.<sup>[4]</sup>

The common practice among parents for the effective management of pain and fever arising due to chicken pox is the administration of antipyretics such as Paracetamol and Ibuprofen. These analgesics are given during the early days of the disease as these two medications are two of the most common over the counter (OTC) medications available in the majority of countries.<sup>[5]</sup> Neurofen and Ibuprofen belong to the same family of medicine collectively known as non-steroidal antiinflammatory drugs (NSAIDs). A case-control study designed by Mikaeloff *et al.* (2008) on the population of UK primary health care service users for a period of 2 months, highlighted that use of NSAIDs in children during an active VZV infection leads to the development of cellulitis caused by *Staphylococcus* along with an increased risk of necrotizing fasciitis (NF). However, the use of paracetamol did not show any significant health risk to the children in comparison to NSAIDs.<sup>[6]</sup>

## MATERIALS AND METHODS

This cross-sectional study was carried out in a primary health care setting in Falloja, Iraq. Data collection was done over a period of 24 weeks from March to September 2019. The idea was to assess the level of perception of parents of use of antipyretics especially Neurofen and Ibuprofen (NSAIDs) in chickenpox infection and if the parents were aware of associated risks of use of NSAIDs during a chickenpox infection.

A total number of 50 parents were randomly selected who presented with their children, having a confirmed diagnosis of chicken pox infection, either made in primary care or in an emergency department. All children were between the age range of 5 to 15 years. This included parents who presented for the first time with a child having chicken pox and also those who have had other children with chicken pox. According to Faber and Fonseca (2014), 50 is a poor sample size. A large sample size helps to gain generalizability of data and helps to detect clinically relevant differences. Using a small sample size increases the chance of assuming true as a false premise.<sup>[7]</sup> Thus, selection of a small sample size of 50 can be considered as one of the limitations of

this study, however, small sample size was selected taking into consideration the time span and local population for which the study was conducted.

Data collection was done by conducting semi-structured interviews with open-ended questionnaires to judge the level of understanding and perception of parents. The questions in general focused on the most commonly used OTC antipyretic medicine by parents in order to manage the symptoms of fever, if they preferred NSAIDs or Paracetamol in fever management, if they used NSAIDs during chicken pox and if they were aware of any associated risks of using NSAIDs in chicken pox.

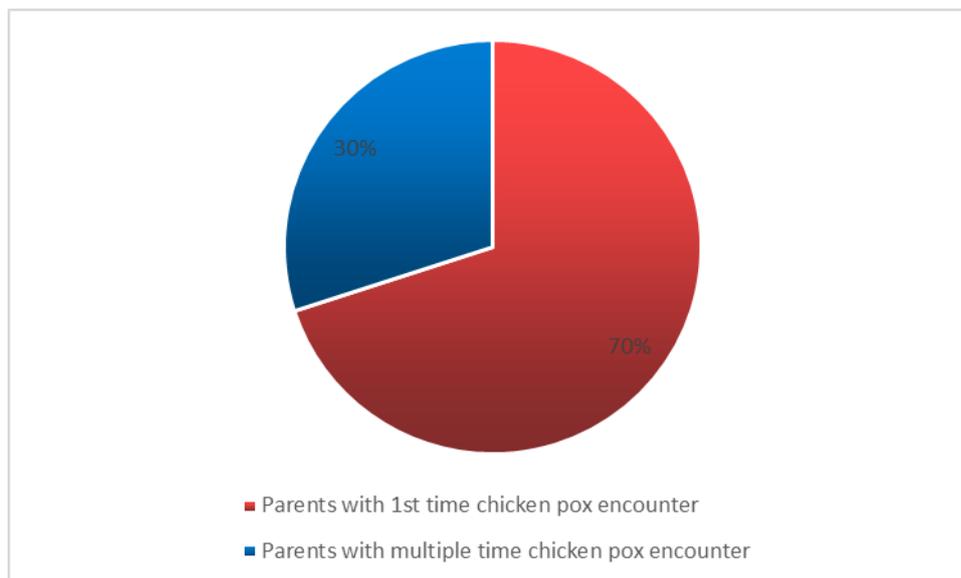
Semi-structured interviews enabled the researchers to encourage conversations with the interviewee and thereby giving participants the flexibility to elaborate on the given information and why they thought that information was relevant to the research.<sup>[8]</sup> Also, semi-structured interviews help the researchers to enjoy freedom to navigate during the conducting of the interviews and thus allowing the participants to lead the interview towards the direction of their own interests and respective personal constructs.<sup>[9]</sup>

## RESULTS

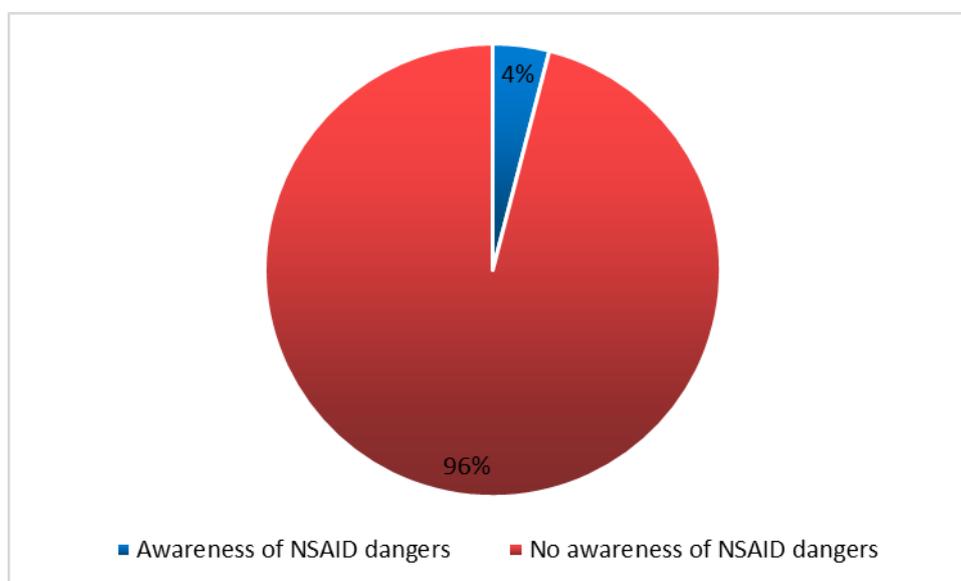
The study involved total 50 parents, out of whom 35 presented for the first time with a child having chicken pox. The remaining 15 parents had other children diagnosed with chicken pox before (Figure 1). Out of the total of 50, 20 parents had a single child and 30 were had multiple children at home. All children who attended with chicken pox during the study were between age range of 5 to 15 years with the mean age of 9.5 years. Interestingly, two (4%) of the 50 parents were aware of any potential risks of NSAIDs use during chicken pox illness, including those 15 parents who had prior experience of managing other children at home with chicken pox. Out of the 50 parents, 20 parents (40%) used both Paracetamol and Ibuprofen for the initial management of fever, while the remaining 30 (60%) used only paracetamol as an antipyretic Table 1.

**Table (1): Study sample characteristics.**

	Number	Percentage
First time chicken pox	35	70
Multiple time chicken pox	15	30
Single child	20	40
Multiple children	30	60
Awareness of NSAID dangers	2	4
No awareness of NSAID dangers	48	96
Used paracetamol plus Ibuprofen	20	40
Used only paracetamol	30	60



**Figure (1): Graph showing comparison of parents with first experience with chicken pox vs parents with previous experience of chicken pox with other child.**



**Figure (2): Graph showing comparison of parents aware of NSAID use risk during chicken pox illness VS parents unaware of NSAID use risk.**

## DISCUSSION

The study conducted by Mikaeloff *et al.* (2008) was supported by two other epidemiological studies; a cohort study conducted by Stone *et al.* (2018)<sup>[10]</sup> and a case control study conducted by Zerr *et al.* (1999).<sup>[11]</sup> All these studies showed the same trend. However, the study conducted by Mikaeloff *et al.* (2008)<sup>[6]</sup> is limited due to possible misclassification of patients as many patients might have taken over the counter NSAIDs without their GP's knowledge. Moreover, there was under reporting of complications possibly if patients ending up in hospital emergency instead of at general practice and were thus coded differently. Therefore, any results found by this study could possibly be considered as a lower bound estimate of the effect.

A case report was published in British Journal of Medicine (BMJ) in May 2018 describing a 4-year-old girl who presented to the emergency department after three days into her chicken pox illness with a rapidly progressive Necrotising Fasciitis (NF) requiring antibiotics and surgical debridement followed by a skin graft and a prolonged hospital stay. She had received two doses of Ibuprofen in the community prior to her presentation. This case report also emphasized caution about not using NSAIDs at all or using them cautiously in primary varicella infection as they have been associated with development of Necrotising Fasciitis (NF).<sup>[12]</sup>

So, what does all this mean for the parents? If a child has chicken pox and is given Ibuprofen or another NSAID,

there is a risk of developing certain complications. Thus Mikaeloff *et al.* (2008)<sup>[6]</sup> stated that it would be better to treat them only when their fever is making them uncomfortable or upset by administering paracetamol. However, there is a gap in parent perception and understanding about the management of fever and pain symptoms of chicken pox. A cross-sectional survey conducted by Cohee *et al.* (2010) over 487 parents who had their children enrolled at two different urban based pediatric clinics in Baltimore, Maryland highlighted the need for improving the understanding and education of parents about perception and management of fever. They showed that African American parents mainly have difficulty with appropriate dosing of antipyretics, while Caucasian and Latino parents experience difficulties in discriminating between normal temperature and fever temperature, thus showing “fever phobia”. Interestingly, regardless of the ethnicity, most parents treat temperatures in the normal range with medicines and also dose antipyretics more frequently.<sup>[13]</sup>

However, the cross-sectional survey by Cohee *et al.* (2010) demonstrated a few limitations including the confusion created between temperature calculation method between Celsius and Fahrenheit by parents, likely creating misinterpretation and poor understanding of normal temperature range, creating “fever phobia” as mentioned. Also, the Latino group was least to use age appropriate method of checking temperatures i.e rectally  $\leq 3$  years age and orally  $\geq 3$  years of age. Only half of parents could identify temperature in fever range and treat appropriately. On a positive note, the survey demonstrated the necessity of improving education of families about proper fever management and the correct dosing of antipyretics.<sup>[13]</sup>

Walsh *et al.* (2007) conducted a qualitative semi-structured interview with fifteen metropolitan parents in Queensland Australia. The aim of the study was to identify the influences on parents’ fever management, beliefs and experiences. The results were very interesting and showed antipyretics were the first line of treatment by many parents irrespective of the temperature. Some preferred specific antipyretics like Ibuprofen as first choice and some showed overdosing as well when using in combination with other antipyretics. Parents’ management of fever and practices were greatly influenced by their beliefs, knowledge, source of information, and number of children in the family. Although this study achieved its target of finding the objectives and important influences were identified, the limitations were, it was not generalized, the parents who participated were well educated and were from metropolitan areas. So, a more generalized study with bigger sample size is required to confirm these findings.<sup>[14]</sup>

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