



The Use of Acetaminophen and Ibuprofen for Treatment of Fever in Children

Marie Arpa, RN, PHN
CHOC Children's, Orange, CA



Background and Clinical Triggers

Fever is a common symptom often experienced by children of all ages. Fever is defined as an elevation in set point in which the body temperature is regulated at higher level and is any temperature above 38.0 C (Hockenberry & Wilson, 2007). Many parents are concerned when their child experiences a fever since it is one of the first signs of an illness. Fever may cause discomfort to the child and parent but fever may be beneficial to the child. Fever is known to enhance immunological processes and is helpful when a child experiences several conditions including meningitis, Kawasaki disease, and juvenile idiopathic arthritis (El-Radhi, 2008).

Fever phobia is a term to describe parents' unrealistic concerns about fever (Crocetti, Moghbeli, & Serwint, 2001). In a study completed by Schmitt (1980), 94% of caregivers thought fever could cause side effects, 63% of caregivers worry a great deal about serious harm resulting from fevers, and 18% of caregivers thought brain damage, and other consequences can be caused by fevers of 38.9o C or less. Crocetti et al. (2001) completed a similar study and found that 91% of caregivers believed fever could cause harmful effects with 21% of caregivers believing brain damage could result from fever.

The management of fever in children can be approached in several ways. Non-pharmacological management of fever include encouraging child to drink fluids, wearing minimum clothing, and reducing room temperature. The most common pharmacological method of treating fever in children is the use of antipyretics. Acetaminophen and ibuprofen are two popular antipyretics used among parents and healthcare providers. The use of aspirin is discouraged due to its link with Reye's syndrome.

Organizational Priority

Fever is a common symptom of both chronic and acute illnesses in children. Many parents take their children to see their pediatrician or to the emergency room when the child is experiencing a fever. As healthcare providers the issue of implementing evidence-based fever management practices is important to help parents understand how to manage fever at home and to give parents the tools to take care of their child's fever. Healthcare providers can alleviate some of the "fever phobia" experienced by parents by educating parents about fever management in the home including the appropriate use of antipyretics.

PICO Question

In children less than 18 years, does acetaminophen in comparison to ibuprofen effectively reduce fevers?

Evidence Search

Databases searches for this review include CINAHL, PubMed, and Ovid. Reviewed websites by Joanna Briggs Institute, American Academy of Pediatrics, American Academy of Family Physicians, Cochrane Library, National Guideline Clearinghouse, Society of Pediatric Nurses and manufacturers of Tylenol® and Motrin®.

Fifteen articles relevant to the PICO question were found among the databases listed above. Articles found were literature reviews, meta-analysis, and experimental and descriptive studies ranging from 1980 to 2008.



Critique & Synthesis of Evidence

- For treatment of fever, ibuprofen is more effective than acetaminophen in reducing fever (Goldman et al., 2004; Perrott et al., 2004; Wahba, 2004; Wong et al., 2001; Van Esch et al., 1995).
- An alternating regimen of acetaminophen and ibuprofen to reduce fever in children is more effective than either drug alone (Hay et al., 2008; Kramer et al., 2008; Mayoral et al., 2000; Sarrell et al., 2006). However, due to safety concerns such as potential dosing errors (underdosing and overdosing) and toxicity, monotherapy of antipyretics is recommended (Carson, 2003; Hay et al., 2008; Kramer et al., 2008; Mayoral et al., 2000).
- The use of ibuprofen does not exacerbate asthma morbidity and provides a possible therapeutic effect compared with acetaminophen. Acetaminophen use in children may lead to an increase risk for wheezing (Kanabar et al., 2007).
- Both acetaminophen and ibuprofen are effective antipyretic agents in children with history of febrile seizures although ibuprofen has greater fever reduction than acetaminophen (Van Esch et al., 1995).
- In studies where adverse effects of acetaminophen and ibuprofen were studied, authors report no significance between the two and the risk of adverse effects are small (Goldman et al., 2004; Lesko & Mitchell, 1999; Perrott et al., 2004).

Summary of Evidence

- Ibuprofen is a better antipyretic than acetaminophen.
- The concerns regarding potential dosing errors, toxicity, and adverse side effects from alternating acetaminophen and ibuprofen are significant enough in the literature to indicate that home management of fever should focus on monotherapy.
- Though this may not be consistent with the practices employed in the acute care setting, it should be noted that health care professionals in acute care are better equipped to assess, monitor, and treat any adverse outcomes of an alternating antipyretic regimen in a manner not possible in the home.

Literature Cited

References available upon request

Acknowledgments

- The Evidence-Based Scholars Program was supported by a grant from the Walden and Jean Young Shaw Foundation.
- Children's Hospital of Orange County Nursing Administration
- Vicky R. Bowden, DNSC, RN
Azusa Pacific University
EBP Scholars Program Mentor

For Further Information

Please contact:
Marie Arpa at marpa@choc.org.