Review Article

Behind the NAEPP Asthma Guidelines

An Integrative Review of Their Development and Utilization in Practice

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Abstract: *An estimated 22.9 million adults and 6.8 million children in the United States have asthma. Historically, high asthma prevalence and alarming morbidity trends continue to be a major cause of disability, placing a huge burden on children, adults, and their families. Research demonstrates that the use of clinical guidelines for the management of asthma improves patient outcomes. The National Asthma Education and Prevention Program (NAEPP) first developed clinical practice guidelines offering specific advice for the management and treatment of asthma in 1991. Despite the availability of these evidence-based guidelines for 19 years, their recommendations for asthma management are underutilized in practice. This integrative literature review chronicles the development of NAEPP guidelines and their utilization in current practice. Database searches included MEDLINE, PubMed, OVID, and CINAHL.*

Keywords: asthma guidelines, NAEPP guidelines, asthma management, evidence-based medicine, asthma clinical practice

This integrative literature review chronicles the development of the National Asthma Education Prevention Program (NAEPP) guidelines and their utilization in practice. An estimated 22.9 million adults and 6.8 million children in the United States have asthma,[1] and its prevalence remains historically high despite efforts to reverse this trend.[2] Although asthma guidelines have been available for 19 years, their recommendations for asthma management have yet to be fully embraced and utilized in clinical practice. The NAEPP is dedicated to translating research findings into clinical practice through the dissemination of clinical practice guidelines that offer specific advice.[3] In 2007, the NAEPP Expert Panel Report-3 (EPR-3) updated guidelines to provide clinicians with the most up-to-date patient care and treatment options available.[3] Database searches included MEDLINE, PubMed, OVID, and CINAHL.

Development of Clinical Guidelines

Clinical guidelines are described as systematically developed patient management statements written to assist clinical decisions and offer recommendations for care of patients with specific conditions.[4] The members of the Clinical Research Roundtable at the US Institute of Medicine suggest that the failure to timely transition new knowledge into clinical practice is a major system barrier in health care.[5] Accordingly, the early impetus behind the initial development of clinical guidelines was an attempt to meet the challenge of properly reviewing, synthesizing, and evaluating relevant evidence for health care providers (HCPs). The purpose of clinical guidelines is 4-fold: (1) to reduce existing uncertainties among the choice of interventions, (2) to offer evidence-based recommendations for better patient outcomes, (3) to standardize care to achieve best practice across a wide range of clinical settings, and (4) to generate greater cost-effectiveness in the health care system, thereby ensuring the reduction of medical errors and malpractice.[6,7] Davidoff et al[8] demonstrated that HCPs would need to read approximately 19 articles per day, 365 days per year, to keep pace with relevant research in their respective field. This is a stark contrast to the 1 hour per week that most HCPs spend on reading research.[9] Clinical guidelines offer an answer for HCPs to stay up to date on the latest recommendations. In a systematic review of 235 guideline implementations, the use of clinical guidelines produced a 10% improvement in patient outcomes.[8] Clinical guidelines demonstrate the promotion and adoption of medical evidence into clinical practice and create a necessary bridge between research and practice.[10]

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Origins of Evidence-Based Medicine

Evidence-based medicine (EBM) is defined as the explicit, judicious, and conscientious use of current best evidence in making decisions about the care of individual patients.[11] With its philosophical origins extending back to the 1850s in Paris, EBM has influenced American medicine by integrating individual clinical expertise and research evidence to improve the quality of health care.[8,12] The term *evidence-based* was first used in 1973 when John Wennberg and his colleagues documented wide variations in practice patterns when conducting research.[13] The researchers found a direct link between medical errors and inappropriate patient care and treatment.[13] In the late 1980s, studies were published that showed a large percentage of procedures being performed by HCPs that were considered inappropriate by the standards of their own experts. It soon became clear that medical treatment could not merely be based on clinical judgment or tradition, but rather must be based on evidence achieved through research, to produce the desired health outcomes.[14]

Governing Clinical Guidelines and Their Development

In an attempt to ensure that clinical practice is guided by evidence-based methodology, many government and professional bodies are charged with producing clinical guidelines. The National Guideline Clearinghouse (NGC), a public resource for evidence-based clinical practice guidelines, is an initiative of the Agency for Healthcare Research and Quality (AHRQ), US Department of Health and Human Services.[15] The NGC was originally created by AHRQ in partnership with the American Medical Association and the American Association of Health Plans (now America's Health Insurance Plans). The NGC provides detailed information on clinical practice guidelines with a goal of promoting their dissemination, implementation, and utilization.[15] At the inception of the NGC, 19 clinical practice guidelines were produced.[15] Now the NGC contains 2153 clinical guidelines subdivided for searching into 23 disease categories including asthma, which has 223 related guidelines available.

Development of the NAEPP Guidelines

The development of clinical guidelines has in turn led to the establishment of organizations specifically designed to create evidence-based recommendations.[16] An expert panel commissioned by the NAEPP Coordinating Committee of the National Heat, Lung, and Blood Institute developed the most recent version of asthma clinical guidelines: the Expert Panel Report 3 (EPR-3) Summary Report 2007—Guidelines for the Diagnosis and Management of Asthma.[3]

The evolution of the NAEPP guidelines over the years reflects our progressive understanding of asthma. In 1989, the NHLBI convened an expert panel to prepare guidelines for the diagnosis and management of asthma. The resulting guidelines were published in 1991, and focused on asthma as an inflammatory disease. This initial report organized recommendations around four components of effective asthma management: (1) the use of objective measures of lung function to assess asthma severity, (2) environmental control to reduce exposure to precipitating factors, (3) patient education, and (4) pharmacologic therapy for long-term management.[3] In 1997, the NAEPP released a second set of guidelines, the Expert Panel Report (EPR)-2, which focused on the importance of early disease recognition and the intervention with long-term controller medications. In 2002, the EPR-2 released an update on selected topics, including pharmacotherapy, peak flow monitoring, and written action plans. In 2007, the EPR-3 published the current version of the guidelines as an evidence-based document with an increased focus on asthma control.[3]

The EPR-3's compilation of research data is unprecedented. The panel included a total of 15 444 research titles in its review and subsequently compiled and organized the research of 1654 articles into tables based on scientific rigor and level of evidence. The assigned tables ranged from evidence level A, which designated research using randomized control trials, through evidence level D, which designated research using a panel consensus judgment. The evidence level (ranging from the highest to lowest, level A to level D) assigned to an article translated to its priority in the EPR-3's recommendations.

Utilization of the NAEPP Guidelines

HCPs worldwide have not consistently utilized asthma guidelines in practice.[17] In the United States, HCPs' compliance with NAEPP guidelines is well below what is needed to optimize patient care.[18,19] Four common reasons of HCPs' poor adherence to NAEPP guidelines are (1) not remembering classification parameters of asthma severity, (2) not remembering various brand and exact dosages of inhaled steroids for different asthma severity, (3) not remembering to ask about various triggers of asthma, and (4) not having sufficient time or resources to provide asthma education and an asthma action plan.[17] Research demonstrated that over 90% of surveyed HCPs stated awareness of the NAEPP guidelines, despite their clinical use not reflecting such.[20]

Wisnivesky et al[21] surveyed 202 HCPs practicing in inner-city neighborhoods and found that self-reported adherence to the NAEPP guidelines was only 62%. Rastogi et al[18] demonstrated that the suboptimal management of asthma, evidenced by underutilization of the NAEPP guidelines among 48 community-based and 32 hospital-based HCPs practicing in inner-city neighborhoods, may play a role in the high asthma-related hospitalization rates among inner-city children. This study compared the asthma management practices between HCPs and evaluated their adherence to the NAEPP guidelines.[18] The research showed that greater emphasis is needed to increase awareness of NAEPP guideline recommendations among HCPs.[18] Janson and Weiss[22] found HCPs' familiarity with the

guidelines and a higher level of training were predictors of their guideline adherence. Even though some studies show trends toward improved HCP guideline adherence and use of their treatment recommendations,[23] others show that despite HCPs' awareness of underprescribing guideline-recommended asthma treatment, their approach and prescriptive behavior did not change.[24]

The benefit of using the NAEPP guidelines in practice is well documented in the literature. Navarro[25] demonstrated that the use of clinical guidelines for asthma management improves patient outcomes while controlling costs. Cabana et al[26] showed that patient care improved with guideline utilization by decreasing inappropriate variation of care and expediting integration of the latest research into practice. In another study analyzing health care utilization for a cohort of 3748 children, an NAEPP-based asthma management program reduced asthma morbidity, increased ICS use, and decreased related hospitalizations and asthma-specific emergency department/outpatient visits.[27]

Treatment Challenges Addressed by NAEPP Guideline Utilization

The underuse of ICSs in the treatment of persistent asthma is considered to be among the greatest obstacles in the scope of improving asthma outcomes.[27] Research demonstrates that failure to prescribe ICSs has a major adverse impact on the quality of life, symptom control, health care utilization costs, and health care disparities.[28-32]

A national random survey of generalists and specialists (N = 512) providing care to asthmatics found that 100% of those surveyed inadequately implemented the NAEPP guidelines.[22] Although the specialists prescribed ICSs more consistently than the generalists, neither group prescribed ICSs consistent with the NAEPP guidelines.[22] This lack of guideline adherence most likely contributed to their ICS underprescriptive behavior.[22]

In a sampling of 900 HCPs, Cabana et al[20] found that only 54% adhered to the NAEPP's recommendations for ICS use, despite 86% acknowledging its specific treatment recommendations for persistent asthma. With similar results, Riekert et al[33] reported underprescribing of ICSs among inner-city children; only 42% of HCPs reported prescribing a controller medication despite 73% of the children being assessed with persistent asthma symptoms.[33] Because ICSs are recommended by the EPR-3 as first-line controller therapy for persistent asthma, adherence to the guidelines results in their appropriate use.[3]

Overuse of Short-Acting Bronchodilators

A second well-documented obstacle within asthma treatment addressed by the NAEPP guidelines is the overuse of short-acting bronchodilators (SABA), such as albuterol.[34] The NAEPP guidelines recommend quantifying the use of a rescue medicine (ie, SABA) to determine disease control.[3] SABA use has been proposed as a tool to identify patients at risk for an exacerbation. The guideline recommendations state that if SABA use equals or exceeds 2 times per week, the patient's asthma in not well controlled and the addition of a long-term controller medication is necessary.[3] SABAs, when used regularly, cause a subtle but significant worsening of asthma control because of an overdependence that develops on its bronchodilator effect while the coexisting inflammatory component of the disease remains unaddressed and continues to worsen.[34] Overuse of inhaled SABAs is associated with increased risk of death from asthma and poor patient outcomes, as evidenced by increased asthma-related emergency department visits and hospitalizations.[35] Kattan et al[36] demonstrated that among inner-city children with asthma, SABA use (68.8%) was significantly more prevalent than the use of ICS medications (54.8%), suggesting poor disease control.

Argument Against Guideline Utilization

Although research clearly supports the use of NAEPP guidelines in practice and has proven their benefit in practice, arguments against the guidelines' utilization abound. Often those arguments center on the belief that asthma guidelines (1) are written for insurance and pharmaceutical companies instead of patients; (2) are insufficient in their attempt to treat asthma as "one size fits all"; (3) recommend ICSs as cornerstone treatment for asthma's inflammatory component, yet inflammation is assumed and not visible in patients; (4) fail difficult-to-treat patients due to overlooking comorbidities in treatment algorithms; and finally (5) are too voluminous. Additional research is needed to fully address how best to overcome such concerns.

Conclusion

Health care in the 21st century relies on both the clinician's medical skills and a treatment approach rooted in EMB.[37] Such methodologies present a strategy to address the challenge of improving health care quality and reducing medical error.[38] The past 20 years have seen a major expansion of EBM that has focused on the increased importance of clinical guidelines.[7] Despite current scientific advances, alarming trends of asthma prevalence contribute to its being a major cause of disability, placing a huge burden on society. Several recent publications suggest that the underutilization of the NAEPP guidelines may in part be related to a lack of understanding.[30] This lack appears to span the spectrum of HCPs in private practice, hospital-based clinics, and university settings.[30] HCPs need to be convinced that there exists compelling evidence from EBM to substantiate the implementation of these guidelines.[30] Regardless of the controversies surrounding clinical guidelines, they decrease variations in health care by standardizing the care given and improve patient outcomes.[11,12] The NAEPP guidelines remain the gold standard in asthma care, and efforts should continue to increase their use in practice.

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