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TREATMENT AND MANAGEMENT OF IMPETIGO IN CHILDREN: EVALUATION OF NEW THERAPEUTIC APPROACHES AND ECONOMIC IMPACTS - A LITERATURE REVIEW

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Abstract: Impetigo is a common skin infection in children, mainly caused by Staphylococcus aureus and Streptococcus pyogenes. The prevalence of impetigo varies due to geographical, socioeconomic and seasonal factors, indicating the need for regionally adapted treatment strategies. Diagnosis is generally clinical, with an emphasis on distinguishing between bullous and non-bullous forms. Treatment with ozenoxacin 1% has been shown to be effective and well tolerated, especially against resistant strains, and may be a cost-effective option compared to other topical antibiotics. However, antimicrobial resistance represents a growing challenge. Controversies about the best treatment practices and the need for a consensus among experts are evident. A community perspective is crucial for adapting interventions to local needs. The inclusion of ozenoxacin on the Brazilian market could improve the management of impetigo, offering a valuable alternative to resistant strains and broadening therapeutic options.
Keywords: *Impetigo; pediatrics; antibiotics.*

INTRODUCTION

Impetigo is a common bacterial skin infection, especially in children, characterized by highly contagious lesions. It is often caused by Staphylococcus aureus and Streptococcus pyogenes. According to a study by Barbieri et al. (2023), impetigo has a significant impact on pediatric health, with a high incidence in diverse populations and regions. The condition can range from superficial lesions to more severe forms that require specialized treatment (Barbieri et al., 2023). The prevalence of impetigo in children can be influenced by geographical, socioeconomic and seasonal factors, reflecting the need for prevention and treatment strategies adapted to the specificities of each region (Neri et al., 2022).

The use of emergency services for impetigo cases can be significant, especially in contexts where access to primary care is limited. A study by Russell et al. (2021) showed that many cases of impetigo are treated in emergency departments, when they could be adequately managed in pediatric practices (Russell et al., 2021). This overload on emergency services not only represents a challenge for the health system, but may also indicate the need to improve the early and efficient management of the condition at primary care levels.

The diagnosis of impetigo is generally clinical and based on observation of the skin lesions. Schachner et al. (2020) point out that differentiating between bullous and non-bullous forms of impetigo is crucial for choosing the appropriate treatment. Early and accurate diagnosis allows for the implementation of more effective therapeutic interventions, minimizing transmission and complications associated with the infection (Schachner et al., 2020).

Treatment guidelines for impetigo vary based on the patient's characteristics and the severity of the infection. According to Neri et al. (2022), the choice of topical therapy should be based on solid evidence that considers the clinical characteristics of impetigo. The guidelines emphasize the importance of following consensus-based practices to ensure that treatment is both effective and safe (Neri et al., 2022).

Ozenoxacin 1% is a relatively recent topical treatment that has shown efficacy in the management of impetigo. Barbieri et al. (2023) found that ozenoxacin is well tolerated and effective, especially against resistant bacterial strains. This drug represents an important option for the treatment of pediatric impetigo, expanding the options available to healthcare professionals (Barbieri et al., 2023).

The economic comparison of treatments for impetigo is essential for decision-making in financially constrained environments. Rodríguez-Quintosa et al. (2022) carried out a comparative study between ozenoxacin and other topical antibiotics, revealing that ozenoxacin can be a cost-effective option compared to other alternatives. Economic analysis is key to ensuring that treatments are affordable and effective within budgetary constraints (Rodríguez-Quintosa et al., 2022).

Antimicrobial resistance represents a growing challenge in the treatment of impetigo. Schachner et al. (2021) discuss how resistance patterns can affect the choice of topical antibiotics. Antibiotic resistance is a significant concern, requiring treatment strategies that consider efficacy against resistant strains and act to preserve the effectiveness of available treatments (Schachner et al., 2021).

Controversies in the treatment of impetigo include debates about best practices and the effectiveness of different therapeutic options. Galli et al. (2022) highlight the main controversies related to pediatric impetigo, addressing the need for a stronger consensus among experts to improve clinical outcomes. Reviewing current practices and updating guidelines can help resolve these controversies and improve treatment (Galli et al., 2022).

Although topical antibiotics are often used, there are cases in which oral antibiotics are necessary, especially for more serious infections. Galindo and Hebert (2021) reviewed topical antibiotics and noted that in severe or extensive situations, oral therapy may be a necessary alternative to ensure effective treatment. This approach is fundamental for dealing with cases that do not respond adequately to topical treatments (Galindo & Hebert, 2021).

Community perspectives on impetigo treatment are essential for adapting strategies to local needs. Mitchell et al. (2020) conducted a qualitative study in Fiji, revealing the challenges faced in resource-limited settings. Understanding community perspectives can improve the effectiveness of interventions and ensure that treatment strategies are adapted to local realities (Mitchell et al., 2020).

In addition, cases of impetigo may have special characteristics that require specific approaches. Hebert et al. (2019) investigated the safety and efficacy profile of ozenoxacin 1% in pediatric patients, while Fujii et al. (2020) described a rare case of impetigo herpetiformis treated with granulocyte and monocyte adsorption apheresis. These studies illustrate the need for specialized approaches for atypical conditions (Hebert et al., 2019; Fujii et al., 2020).

Currently, ozenoxacin is not available for sale in Brazil, which limits the treatment options for impetigo. The inclusion of this drug in national therapy could represent a significant advance, offering a valuable alternative for patients facing resistance to other antibiotics. The adoption of ozenoxacin could improve clinical outcomes and expand the treatment options available to the pediatric population (Hebert et al., 2019; Rodríguez-Quintosa et al., 2022).

In conclusion, impetigo continues to represent a significant challenge in pediatrics, requiring an integrated approach that considers both clinical efficacy and economic and community aspects. The literature review reveals the importance of evidence-based strategies for treatment and highlights the need to improve the management of impetigo to better meet the needs of patients (Barbieri et al., 2023; Schachner et al., 2021).

The scientific article aims to provide a comprehensive review of pediatric impetigo, addressing its clinical characteristics, diagnosis, treatment and economic management. The analysis integrates recent studies to highlight the prevalence and

impact of the infection, current guidelines for treatment, including the efficacy of new drugs such as ozenoxacin, and the economic considerations associated with treatment.

METHODS

The search for scientific articles was carried out using the National Library of Medicine (PubMed) database. The descriptors were "*Impetigo*"; "*pediatric*"; "*antibiotic*", using the Boolean operator "AND" between the respective words. The categories were: clinical trial and randomized clinical trial. The studies were selected from publications between 2020 and 2024, using articles in English and Portuguese as inclusion criteria. The exclusion criterion was articles that added other pathologies to the central theme, disconnected from the proposed subject. The academic papers were reviewed using the following steps, in the following order: defining the topic; establishing the study categories; proposing inclusion and exclusion criteria; checking and then analyzing the publications; organizing the information; and presenting the data.

RESULTS

By associating the descriptors used, a total of 199 papers were obtained from the PubMed database. Using the inclusion criterion: articles published in the last 5 years (2020-2024), resulted in a total of 35 articles. Next, clinical trials, randomized controlled trials or journal articles were added as inclusion criteria, giving a total of 35 articles. Articles in Portuguese or English were selected, resulting in 25 articles and then the free full text option was added, totaling 23 articles. After reading the abstracts, those that did not fit the topic or were duplicated were excluded, totaling 15 articles, as shown in Figure 1.

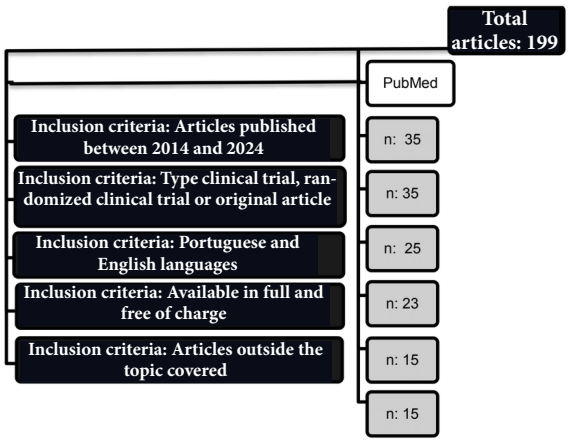

FIGURE 1: Flowchart for identifying articles in PubMed.

Source: Authors (2024)

DISCUSSION

Impetigo is a common bacterial infection in childhood, characterized by highly contagious skin lesions. The current understanding of the incidence, diagnosis and treatment of pediatric impetigo is complex and multifaceted, reflecting the diversity of approaches and results found in recent studies.

The prevalence of impetigo in children can vary significantly. A study by Barbieri et al. (2022) in primary care settings in Italy revealed a high incidence of non-bullous impetigo. This study demonstrated that, despite available treatment options, impetigo remains a significant concern for pediatric healthcare professionals. Complementing this view, Russell et al. (2021) analyzed the use of emergency services for impetigo cases in the United States between 2013 and 2015. The results indicated that many cases of impetigo could be treated more efficiently in pediatric offices, suggesting that a substantial portion of emergency room visits could be avoided with proper management at primary levels of care.

The diagnosis of impetigo is often clinical, based on the presentation of the lesions. Schachner et al. (2020) discuss the treatment guidelines and typical clinical features of impetigo, emphasizing the importance of

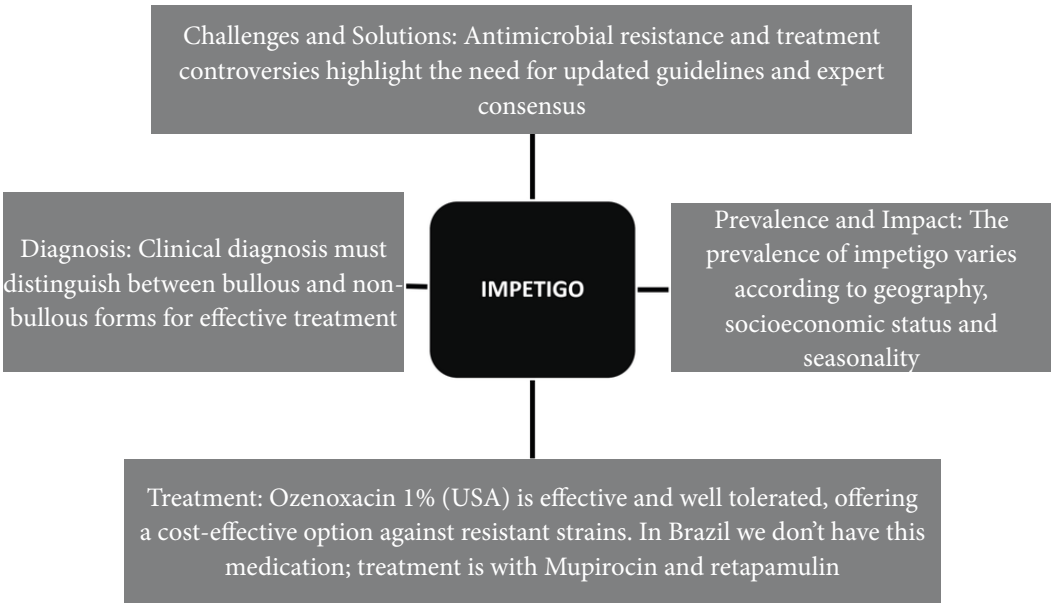

FIGURE 2: Summary of the most frequently found results according to the articles analyzed.
Source: Authors (2024)

distinguishing between bullous and non-bullous forms of the disease. This correct diagnosis is essential for selecting the most effective treatment. Neri et al. (2022) highlight the ideal characteristics for topical therapy, revealing the need for a consensus among specialists to ensure that the treatments chosen are based on solid evidence and appropriate for the clinical presentations observed.

Treatments for impetigo generally involve the use of topical antimicrobials. Barbieri et al. (2023) focused on the efficacy of ozenoxacin 1% cream in the pediatric population and found this treatment to be an effective and well-tolerated option for impetigo. The research highlighted that ozenoxacin may be particularly useful due to its efficacy against resistant strains and its good tolerance in children. In contrast, Rodríguez-Quintosa et al. (2022) carried out a comparative study between ozenoxacin and other topical antibiotics. They found that, despite ozenoxacin's efficacy, its option may be more economical compared to other treatments, which is relevant for contexts with budget constraints.

The economic impact of impetigo treatment is a crucial factor in the choice of treatment. Rodríguez-Quintosa et al. (2022) point out that ozenoxacin can offer a cost-effective solution compared to other topical antibiotics, influencing treatment decisions in financially constrained settings. The economic analysis presented by these authors is vital for healthcare professionals and policymakers who need to balance the effectiveness of treatment with the associated costs.

Antimicrobial resistance is a growing concern that can complicate the treatment of impetigo. Schachner et al. (2021) discuss how antimicrobial resistance patterns should influence treatment decisions. They present an algorithm that helps guide healthcare professionals in choosing topical antibiotics that are effective against resistant strains, an important approach to maintaining the effectiveness of treatments and preventing the rise of resistance.

The controversies surrounding the treatment of impetigo include debates about best practices and the effectiveness of different therapeutic options. Galli et al. (2022) address

the main controversies related to pediatric impetigo and offer a critical overview of current practices. The study highlights the need for a consensus among experts to improve clinical outcomes and ensure that practices are based on the best available evidence.

Although topical antibiotics are often used, there are cases in which oral antibiotics are necessary, especially for more severe infections. Galindo and Hebert (2021) reviewed current topical antibiotics for the treatment of impetigo and noted that in more severe or extensive situations, oral therapy may be a necessary alternative to ensure adequate and effective treatment.

In addition to clinical and economic considerations, it is crucial to understand community perspectives on the treatment of impetigo. Mitchell et al. (2020) conducted a qualitative study in Fiji to explore community perceptions of impetigo and drug administration. This study reveals the challenges faced in resource-limited settings and the importance of adapting treatment strategies to local needs and realities, providing a more comprehensive view of how interventions can be improved in different contexts.

Some cases of impetigo may have special characteristics that require specific approaches. Hebert et al. (2019) investigated the safety and efficacy profile of ozenoxacin cream 1% in pediatric patients and found this treatment to be safe and effective for this population. In addition, Fujii et al. (2020) described a rare case of impetigo herpetiformis treated with granulocyte and monocyte adsorption apheresis, illustrating the need for specialized approaches for atypical conditions that do not respond to conventional treatments.

Currently, ozenoxacin, a topical antibiotic used to treat impetigo, is not available for sale in Brazil. This drug has been approved and widely used in several European countries and the United States due to its proven efficacy against common pathogens responsible for skin infections (Hebert et al., 2019; Rodríguez-Quintosa et al., 2023). In Brazil, impetigo is usually treated with topical antibiotics such as mupirocin or retapamulin, which, despite being effective, may not cover all bacterial resistance profiles and, in some cases, may not be the first choice in high-resistance environments (Galli et al., 2024; Galindo & Hebert, 2022).

The introduction of ozenoxacin on the Brazilian market would bring a significant advance in the management of impetigo and other skin infections. With its specific mechanism of action and proven efficacy, ozenoxacin could offer a valuable alternative for patients who do not respond adequately to existing treatments or who have bacterial strains resistant to current antibiotics (Schachner et al., 2023; Hebert et al., 2019). The inclusion of this drug in available therapeutics could potentially improve clinical outcomes and broaden treatment options, better meeting patients' needs and contributing to a more robust and effective approach to combating skin infections (Rodríguez-Quintosa et al., 2023; Galindo & Hebert, 2022).

In conclusion, impetigo remains a significant condition in pediatrics, with a variety of challenges in diagnosis, treatment and economic management. The literature review reveals the importance of evidence-based strategies for treatment and highlights the need for an integrated approach that considers both clinical efficacy and economic and social aspects. The combination of up-to-date clinical practices and the consideration of economic and community factors are essential to improve the management of impetigo and more effectively meet the needs of pediatric patients.

CONCLUSION

Impetigo remains a relevant condition in pediatric practice, requiring a multifaceted approach for its effective management. This study has shown that impetigo, a highly contagious skin infection, mainly affects children and can range in severity from superficial lesions to more severe forms that require specialized treatment. The high incidence of impetigo and its varied prevalence, influenced by geographical, socioeconomic and seasonal factors, underline the need for strategies adapted to the particularities of each region to improve prevention and treatment. Early and accurate diagnosis of impetigo, often based on clinical observation of the lesions, is essential for choosing the right treatment. Distinguishing between bullous and non-bullous forms of the disease is essential to ensure that therapy is targeted effectively. Advances in treatment, especially with the use of ozenoxacin 1%, have proved to be a valuable addition to the therapeutic options available. The efficacy and good tolerance of this topical antibiotic, particularly against resistant strains, highlight its potential as an important alternative for the treatment of pediatric impetigo. However, the economic impact of the treatments should not be overlooked either. The economic comparison between ozenoxacin and other topical antibiotics revealed that ozenoxacin can offer a cost-effective solution, especially in restricted financial contexts. This economic analysis is crucial to ensure that treatment choices are both effective and feasible within budgetary constraints. Antimicrobial resistance is a growing concern that affects the choice of topical antibiotics. The need for strategies that address resistance and preserve the efficacy of available treatments is a significant challenge for healthcare professionals. Controversies surrounding best practices and the efficacy of different therapeutic options also emphasize the need for a stronger consensus among experts to improve clinical outcomes and update treatment guidelines. Furthermore, understanding community perspectives and adapting strategies to local realities are essential to improving the effectiveness of interventions. Qualitative studies, such as the one carried out in Fiji, offer valuable insights into the challenges faced in contexts of limited resources and the importance of treatment strategies adapted to local needs. The inclusion of ozenoxacin on the Brazilian market could represent a significant advance in the approach to impetigo, offering an effective alternative to resistant bacterial strains and improving clinical outcomes. The combination of up-to-date clinical practices, cost-effective strategies and consideration of community factors is crucial to the successful management of impetigo and to meeting the needs of pediatric patients more effectively. It is therefore essential that the management of impetigo is evidence-based, taking into account clinical efficacy, economic impact and community realities. Integrating these aspects can provide a more robust and effective approach to tackling the challenges associated with this common skin infection.

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