

## Bacterial Conjunctivitis: An Updated Review for Healthcare Professionals

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### Abstract

*Bacterial conjunctivitis, commonly known as "pink eye," is a prevalent ocular condition often diagnosed in primary healthcare settings. It is caused by bacterial infections, presenting symptoms like redness, itching, and discharge. While viral and allergic conjunctivitis are more common, bacterial conjunctivitis can lead to severe complications if left untreated. This review explores bacterial conjunctivitis' etiology, epidemiology, pathophysiology, diagnosis, treatment, and complications, offering healthcare professionals insights for accurate management and diagnosis. The aim of this review is to update healthcare professionals on bacterial conjunctivitis, focusing on its causes, epidemiology, clinical features, diagnostic methods, and management strategies. This article synthesizes existing research on bacterial conjunctivitis, drawing from a range of sources to provide comprehensive insights into its transmission, pathogenesis, and the clinical approach to diagnosis and treatment. The review also examines bacterial pathogens, diagnostic tools, and antibiotic resistance patterns. Bacterial conjunctivitis is most commonly caused by *Haemophilus influenzae*, *Streptococcus pneumoniae*, and *Staphylococcus aureus*. In children, it is often linked to otitis media, while adults may experience more frequent cases of *Staphylococcus aureus*. The condition is diagnosed through clinical presentation, with occasional reliance on culture and PCR testing for complicated cases. Antibiotic treatment, particularly with topical agents, is effective in most cases, although overuse remains a concern. Empiric antibiotic therapy is often prescribed despite a relatively low bacterial infection rate in pediatric cases. Bacterial conjunctivitis is a common, treatable condition with a generally favorable prognosis. However, misdiagnosis and unnecessary antibiotic use contribute to the growing problem of antimicrobial resistance. Clinicians should adopt diagnostic approaches to minimize unnecessary prescriptions and enhance treatment efficacy.*

**Keywords:** Bacterial Conjunctivitis, Antibiotic Resistance, Diagnosis, Treatment, *Staphylococcus Aureus*, *Haemophilus Influenzae*, Epidemiology, Pathophysiology, Public Health.

### Introduction

Conjunctivitis, frequently referred to as "pink eye," is among the most commonly diagnosed ophthalmologic conditions in primary healthcare. The condition is primarily characterized by ocular

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redness, often accompanied by symptoms such as itching, discomfort, and discharge. The hallmark redness results from the dilation of conjunctival blood vessels, which can occur due to various underlying causes, including bacterial or viral infections, allergen exposure, or contact with chemical irritants [1]. Viral and allergic conjunctivitis occur more frequently in the general population, yet bacterial conjunctivitis presents unique challenges for clinicians due to its association with higher morbidity and its potential for severe complications if left untreated [2][3]. The condition is notable for its impact on both individual patients and public health, given its highly contagious nature and the risk of outbreaks in community settings. While viral and allergic conjunctivitis are often resolved without specific treatment, bacterial conjunctivitis frequently necessitates targeted antibiotic therapy, underscoring the importance of accurate diagnosis. Misdiagnosis or overuse of antibiotics in non-bacterial cases contributes to the growing issue of antimicrobial resistance, further complicating the management of ocular infections. Therefore, understanding the clinical features, causative agents, and epidemiological patterns of conjunctivitis is crucial for effective patient care. This review provides a detailed exploration of bacterial conjunctivitis, focusing on its etiology, epidemiology, and pathophysiology. These insights aim to enhance diagnostic accuracy and guide appropriate therapeutic interventions, ultimately improving outcomes for patients affected by this condition.

### *Etiology*

Bacterial conjunctivitis is primarily transmitted through direct or indirect contact with infected individuals or contaminated surfaces. Modes of transmission include hand-to-eye contact, exposure to fomites, or respiratory droplet spread [4]. In pediatric populations, the most common causative pathogens are *Haemophilus influenzae*, *Streptococcus pneumoniae*, and *Moraxella catarrhalis* [5][6][7]. In contrast, adult cases are more frequently associated with *Staphylococcus aureus*, although *Haemophilus influenzae* and *Streptococcus pneumoniae* also contribute to a smaller proportion of infections [2]. Additionally, there has been an observed rise in methicillin-resistant *Staphylococcus aureus* (MRSA) infections in both pediatric and adult populations [2]. Individuals who wear contact lenses are particularly susceptible to infections caused by gram-negative organisms such as *Pseudomonas aeruginosa*, which is a common isolate in critically ill or hospitalized patients [4]. Neonates may develop acute bacterial conjunctivitis as a result of vertical transmission of *Neisseria gonorrhoeae* or *Chlamydia trachomatis* during childbirth. These pathogens are also implicated in hyperacute conjunctivitis cases among sexually active adolescents and adults [1]. The diversity of bacterial pathogens responsible for conjunctivitis underscores the need for clinicians to consider patient demographics, medical history, and potential risk factors when evaluating cases. Timely identification of the causative organism is essential for initiating appropriate treatment, preventing complications, and reducing the risk of transmission. Improved understanding of transmission dynamics and pathogen-specific trends can aid in the development of more targeted prevention and management strategies for bacterial conjunctivitis.

### *Epidemiology*

Bacterial conjunctivitis represents a significant public health concern due to its high prevalence and potential for community spread. In the United States alone, acute conjunctivitis of all etiologies is estimated to affect approximately 6 million individuals annually [8]. Presentations of red-eye symptoms account for 1–4% of general practitioner visits in developed countries, with bacterial conjunctivitis being the most frequently diagnosed cause [4]. Epidemiological data indicate a seasonal trend, with bacterial conjunctivitis cases peaking between December and April [4]. The condition is particularly prevalent among pediatric populations, where it remains the second most common infectious etiology of conjunctivitis [2]. A 1981 study found that bacteria were responsible for 54% of pediatric acute conjunctivitis cases [3]. However, more recent data from a 2017 survey of 3000 children with acute conjunctivitis indicated that bacterial pathogens accounted for only 10% of cases [8]. Despite this decline, both studies highlighted a concerning trend of empiric antibiotic overprescription for conjunctivitis, often exceeding the actual need for antimicrobial therapy [3][8]. This pattern underscores the necessity for clinicians to employ evidence-based diagnostic approaches and reserve antibiotics for confirmed bacterial cases to mitigate the risk of antimicrobial resistance. Understanding the epidemiological characteristics of bacterial conjunctivitis, including age-specific prevalence, seasonal variations, and changing pathogen profiles, is essential for optimizing diagnostic accuracy and ensuring effective management of this widespread condition.

### *Pathophysiology*

The pathogenesis of bacterial conjunctivitis begins with the introduction of pathogenic microorganisms to the conjunctival surface, leading to infection. Direct transmission, often facilitated by physical contact or contaminated objects, plays a central role in initiating the condition. Once pathogens gain access to the conjunctiva, they may exploit disruptions in the epithelial barrier or deficiencies in the host's immune defenses to establish infection. A compromised epithelial layer or weakened ocular defense mechanisms, such as reduced tear production or altered tear film composition, creates a favorable environment for bacterial proliferation. Immunocompromised individuals are particularly susceptible to severe or recurrent bacterial conjunctivitis [2]. The inflammatory response triggered by the infection involves the recruitment of immune cells, release of cytokines, and increased vascular permeability, all of which contribute to the clinical manifestations of redness, swelling, and discharge. Different bacterial species possess unique virulence factors that influence the severity and progression of the disease. For instance, gram-negative organisms such as *Pseudomonas aeruginosa* produce toxins and enzymes that can exacerbate tissue damage, particularly in contact lens users [4]. Conversely, gram-positive bacteria like *Staphylococcus aureus* can persist in the ocular environment through biofilm formation, complicating treatment [2]. Understanding the mechanisms underlying bacterial conjunctivitis is essential for developing targeted therapeutic interventions and improving patient outcomes. By addressing the complex interplay between host factors and pathogen characteristics, clinicians can better manage this common yet potentially serious ocular condition.

### *History and Physical*

Patients with bacterial conjunctivitis frequently report redness, tearing, and discharge from one or both eyes, accompanied by varying levels of discomfort [1]. When assessing patients, clinicians should inquire about the duration of symptoms, categorizing the condition as hyperacute, acute (less than three to four weeks), or chronic (beyond four weeks) [4]. A thorough patient history is essential, encompassing previous ocular trauma, recurrent episodes, past treatments, contact lens use, immune status, and sexual history [1]. Conjunctivitis in children often presents alongside otitis media, necessitating an evaluation of associated otic symptoms [6]. Clinical features can aid in differentiating bacterial conjunctivitis from other etiologies, yet symptom overlap is common. For example, purulent or mucopurulent discharge has traditionally indicated bacterial origin, while watery discharge suggests viral or allergic causes [2]. However, studies have contested this, revealing inconsistencies in correlating discharge types with causation [9]. Predictive markers for bacterial conjunctivitis include glued eyelids, absence of itching, and no prior conjunctivitis history [2]. Physical examination often reveals conjunctival erythema and purulent discharge, underscoring the importance of comprehensive ocular evaluation, including visual acuity and corneal involvement [2][3]. A slit-lamp examination can provide additional insight but is rarely available in primary care settings. In pediatric cases with reported ear symptoms, otoscopic evaluation is crucial for diagnosing concurrent otitis media [6]. Emerging evidence highlights the variability in bacterial conjunctivitis presentations, emphasizing the importance of tailored clinical assessments to avoid unnecessary empiric antibiotic use while ensuring optimal patient outcomes.

### *Evaluation*

Diagnostic evaluation for bacterial conjunctivitis typically requires minimal laboratory or radiographic testing. The condition's clinical presentation often suffices for diagnosis, but specific scenarios may necessitate additional investigations [1]. For instance, conjunctival cultures are recommended when ophthalmia neonatorum is suspected or when purulent discharge raises concerns about gonococcal or chlamydial infections [2]. Cultures are also valuable in recurrent or treatment-resistant cases, providing clarity on causative organisms and guiding appropriate therapy [2]. Advanced diagnostic tools, such as polymerase chain reaction (PCR), have enhanced the sensitivity and specificity of pathogen identification. These tools are particularly useful in distinguishing between bacterial, viral, and chlamydial etiologies. However, PCR is not routinely employed due to cost and availability constraints. In complex cases, ancillary tests such as Gram staining or direct fluorescent antibody testing may assist in identifying specific pathogens like *Neisseria gonorrhoeae* or *Chlamydia trachomatis* [1][2]. While laboratory testing is generally reserved for severe or atypical cases, imaging studies are rarely indicated in bacterial conjunctivitis unless orbital

cellulitis or abscess formation is suspected. In such instances, computed tomography (CT) or magnetic resonance imaging (MRI) may be employed to assess orbital structures and rule out complications. Emerging research underscores the utility of point-of-care diagnostic devices, which could streamline the identification of pathogens in primary care settings [2]. Overall, the evaluation process for bacterial conjunctivitis remains focused on clinical findings. However, advancements in molecular diagnostics and point-of-care technologies hold promise for improving diagnostic accuracy and enabling targeted antimicrobial therapy, reducing the risk of resistance and improving patient outcomes [1][2].

### *Treatment / Management*

The management of bacterial conjunctivitis involves a nuanced approach, balancing the benefits of treatment with considerations such as the natural disease course, antibiotic resistance, and stewardship principles. Although the natural resolution of bacterial conjunctivitis typically occurs within one week, antimicrobial therapy has been shown to hasten recovery, reduce symptoms, and limit transmission [4]. Empiric antibiotic therapy remains common due to the difficulty in distinguishing bacterial conjunctivitis from other causes. Studies suggest that approximately 50% of pediatric conjunctivitis cases are bacterial; however, antibiotic prescriptions are issued in up to 95% of cases, highlighting a potential overuse of antimicrobials [3][10]. Topical antibiotics, such as aminoglycosides, polymyxin B combinations, macrolides, and fluoroquinolones, are the standard treatment, with a typical duration of five to seven days [6]. Emerging resistance patterns among ocular pathogens have raised concerns, prompting a shift toward newer fluoroquinolones with broader coverage and reduced resistance rates [6]. While effective, these agents are costly, limiting their widespread use. Bacterial conjunctivitis caused by gonococcal or chlamydial infections necessitates systemic therapy, often with agents like ceftriaxone for gonorrhea or erythromycin for *Chlamydia trachomatis* [1][11]. Preventive measures, including patient education on hygiene and proper contact lens care, play a pivotal role in reducing infection rates. Continued research into novel therapeutics, such as antimicrobial peptides and biofilm-disrupting agents, may revolutionize future management strategies. Follow-up care is critical, particularly in complicated or refractory cases, to ensure resolution and prevent long-term complications [4].

### *Differential Diagnosis*

When diagnosing bacterial conjunctivitis, it is important to consider other conditions that present similar symptoms, such as viral and allergic conjunctivitis. Viral conjunctivitis typically manifests with watery discharge and is often accompanied by itching, whereas allergic conjunctivitis shares these characteristics and is frequently associated with seasonal or environmental allergens [2][4]. Trauma to the eye may also mimic the symptoms of bacterial conjunctivitis, with redness and discharge, making it essential to consider the possibility of injury when evaluating patients [4]. Additionally, conditions like keratitis and iridocyclitis should be differentiated, as they involve infections of the cornea or inflammation of the iris, both of which can cause significant morbidity if not promptly addressed [4]. While bacterial conjunctivitis typically presents with purulent discharge, these differential diagnoses highlight the need for careful clinical evaluation to avoid misdiagnosis and ensure appropriate treatment. The overlapping symptoms between bacterial, viral, allergic, and traumatic eye conditions underscore the complexity of accurate diagnosis and the necessity for thorough patient history, symptom assessment, and physical examination. The recognition of associated features, such as a history of trauma, itching, or the presence of systemic symptoms, can further guide the clinician in distinguishing bacterial conjunctivitis from these other etiologies and providing the most effective care [2][4].

### *Prognosis*

The prognosis for bacterial conjunctivitis is generally favorable, with the vast majority of cases resolving completely, even without antibiotic treatment. When treated appropriately, either with antibiotics or through expectant management, the condition typically improves within a week without lasting complications [2][6]. The likelihood of adverse events is minimal, particularly in cases of uncomplicated bacterial conjunctivitis. The absence of significant corneal involvement or underlying systemic conditions contributes to the excellent prognosis for most patients [6]. Although the natural course of the disease may lead to symptom

resolution on its own, antibiotic therapy can accelerate recovery, reduce transmission risk, and alleviate symptoms more quickly [2]. Expectant management, where no antibiotics are administered, is also a viable option for some patients, especially when the infection is mild or self-limiting. However, careful monitoring is necessary to ensure that the infection does not persist or worsen. For individuals with complicated cases, such as those with immunocompromised states or concurrent ocular issues, the prognosis may vary, and more intensive treatment may be required. Overall, bacterial conjunctivitis remains a condition with a generally positive outcome, provided timely and appropriate care is provided [2].

### *Complications*

Complications resulting from bacterial conjunctivitis are relatively rare but can be severe in certain circumstances. Infections that are not adequately treated or that involve aggressive bacterial strains may lead to more serious ocular conditions, such as keratitis, corneal ulceration, or even perforation of the cornea, which can result in permanent vision loss [2][4][6]. While the majority of bacterial conjunctivitis cases resolve without complication, patients with underlying risk factors—such as compromised immune systems, contact lens use, or concurrent systemic infections—are at higher risk for developing these more severe outcomes [6]. The development of corneal ulcers, in particular, can lead to scarring and significant visual impairment if not promptly treated. Furthermore, untreated or poorly managed cases can result in secondary infections or spread to other parts of the eye, such as the orbit or deeper ocular structures. Despite these potential complications, such adverse outcomes remain uncommon when bacterial conjunctivitis is diagnosed early and treated appropriately. Timely interventions, such as the use of broad-spectrum antibiotics or more intensive management in high-risk patients, can prevent these complications. Regular follow-up and close monitoring of symptoms can further reduce the risk of progression to more serious conditions [2][4][6].

### *Consultations*

Referral to an ophthalmologist is recommended in cases of bacterial conjunctivitis where there is significant concern for complications or when standard treatment fails to resolve the condition. Specific indications for consultation include persistent or severe symptoms, such as vision loss, intense pain, recurrent infections, or the presence of corneal involvement, which may indicate more serious underlying conditions [2]. Ophthalmologists are also consulted when a patient experiences a lack of improvement after appropriate antibiotic therapy, as this may suggest the presence of an uncommon or resistant bacterial strain, necessitating more specialized treatment. In cases of severe conjunctivitis that causes substantial discomfort or interferes with the patient's daily activities, consultation with a specialist can provide a more targeted approach to managing the condition. Additionally, if there are concerns regarding the presence of complications such as corneal ulcers or perforations, an ophthalmologist's expertise is crucial for preventing long-term damage and ensuring appropriate care. By referring patients with complicated or non-resolving bacterial conjunctivitis, clinicians can help ensure timely interventions, improving outcomes and preventing potential vision loss [2].

### *Patient Education*

It is imperative that patients are educated on the signs and symptoms indicative of potential complications arising from bacterial conjunctivitis. Contact lens wearers should be advised to discontinue lens use until their symptoms have fully resolved and they have completed the prescribed treatment course. Preventing transmission is a critical aspect of patient education, with a focus on proper hand hygiene practices. For adolescents and adults diagnosed with gonococcal or chlamydial infections, counseling on safe sexual practices and the need for partner treatment is essential. Educating parents and school administrators about the condition can help reduce school absenteeism in children affected by bacterial conjunctivitis. Furthermore, once treatment has commenced, pediatric patients may return to school activities, assuming the condition has shown improvement. The dissemination of such information ensures both the effective management of the condition and the prevention of further spread, promoting the health and well-being of both individual patients and the broader community [1] [3] [4].



### Enhancing Healthcare Team Outcomes

Bacterial conjunctivitis presents a common yet complex clinical challenge for healthcare providers due to the variability in its presentation, which often complicates its differentiation from other causes of conjunctivitis. This diagnostic uncertainty has contributed to the over-prescription of antibiotics. An interdisciplinary healthcare team is essential for improving clinical outcomes. Most patients initially present to primary care providers or nurse practitioners, who are tasked with making appropriate referrals to ophthalmologists when there is uncertainty regarding the diagnosis or when vision loss is a concern. In addition, primary clinicians should emphasize the importance of hand hygiene and avoid the sharing of personal care items during the acute phase of the illness. Research has identified specific clinical features that may indicate a bacterial etiology, with studies suggesting that these characteristics can help guide more accurate management decisions. While antimicrobial therapy has proven beneficial for certain cases, the majority of uncomplicated bacterial conjunctivitis cases resolve on their own without adverse consequences. Effective management may therefore involve a combination of reassurance, patient education, and, when necessary, the use of antibiotics. Collaboration with pharmacists, infectious disease specialists, and ophthalmologists can enhance clinical decision-making, particularly in addressing local antibiotic resistance patterns and refining therapeutic strategies. Pharmacists play a crucial role in ensuring appropriate medication selection, verifying dosing and duration, reconciling medications to prevent drug interactions, and educating patients on medication adherence. Nursing staff contribute to monitoring treatment adherence, assessing patient progress, and managing any adverse reactions during follow-up visits or inpatient care. In cases involving complications, ophthalmology referrals are critical, and collaboration with specialists can further guide the decision-making process regarding the initiation of antibiotic therapy. Adhering to evidence-based practices in the diagnosis and management of bacterial conjunctivitis, while promoting antibiotic stewardship, can improve patient outcomes and contribute to the overall health of the community. The implementation of a team-based approach, involving physicians, specialists, nurses, and pharmacists, is vital in achieving optimal patient outcomes [2][3][4][9][12][13].

### Conclusion

Bacterial conjunctivitis remains a widespread and clinically significant condition, with its high transmissibility contributing to public health concerns. The condition is commonly caused by *Haemophilus influenzae*, *Streptococcus pneumoniae*, and *Staphylococcus aureus*, with a distinct pathogen profile emerging in pediatric and adult populations. In pediatric cases, *Haemophilus influenzae* and *Streptococcus pneumoniae* are most prevalent, while *Staphylococcus aureus* dominates in adults. The emergence of methicillin-resistant *Staphylococcus aureus* (MRSA) has compounded the challenges associated with managing this infection, particularly in contact lens users and immunocompromised individuals. Diagnosis of bacterial conjunctivitis is primarily clinical, based on hallmark symptoms such as purulent discharge and ocular redness. In more complicated or atypical cases, laboratory tests like conjunctival cultures and PCR can help identify the causative pathogen. While empiric antibiotic treatment is frequently used, recent studies highlight the issue of overprescription, with antibiotics often prescribed for non-bacterial cases. This overuse contributes to growing concerns regarding antimicrobial resistance, an issue exacerbated by the over-reliance on empirical therapy. Topical antibiotics, including fluoroquinolones, macrolides, and polymyxin B combinations, remain the first-line treatment for bacterial conjunctivitis, with most cases resolving within 5 to 7 days. The role of antibiotic therapy is well-established in accelerating recovery, preventing complications, and reducing transmission, yet the necessity of such treatment in all cases remains a point of contention. In pediatric populations, a cautious approach is encouraged, with a significant proportion of cases resolving without antibiotics. However, in complicated cases, such as gonococcal or chlamydial infections, systemic antibiotics may be required. Despite the generally favorable prognosis of bacterial conjunctivitis, it can lead to serious complications, particularly in immunocompromised individuals. These complications include corneal ulceration, keratitis, and even vision loss in rare cases. Early intervention and correct antibiotic usage significantly reduce the risk of such outcomes. Preventive measures, such as promoting good hygiene and educating patients on contact lens care, remain essential in minimizing infection spread. In conclusion, bacterial conjunctivitis, while treatable, poses ongoing challenges in clinical practice, particularly concerning diagnostic accuracy and the appropriate use of antibiotics. Continued research into more effective

diagnostic methods, as well as efforts to combat antibiotic overuse, are essential to improving patient outcomes and reducing the risk of resistance. A judicious approach to treatment, with a focus on evidence-based practices, is crucial in addressing this common yet potentially serious ocular condition.

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## التهاب الملتحمة البكتيري: مراجعة محدثة للمهنيين الصحيين

### المخلص:

**الخلفية:** يعتبر التهاب الملتحمة البكتيري، المعروف باسم "العين الوردية"، حالة عينية شائعة يتم تشخيصها غالبًا في مراكز الرعاية الصحية الأولية. وهو ناتج عن العدوى البكتيرية، ويتميز بأعراض مثل الاحمرار والحكة والإفرازات. على الرغم من أن التهاب الملتحمة الفيروسي والحساسي أكثر شيوعًا، إلا أن التهاب الملتحمة البكتيري قد يؤدي إلى مضاعفات خطيرة إذا تُرك دون علاج. تستعرض هذه المراجعة مسببات التهاب الملتحمة البكتيري، وبانياته، وفسيولوجيتها المرضية، وتشخيصه، وعلاجه، ومضاعفاته، وتقدم للمهنيين الصحيين رؤى لإدارة وتشخيص الحالة بشكل دقيق.

**الهدف:** تهدف هذه المراجعة إلى تحديث المهنيين الصحيين حول التهاب الملتحمة البكتيري، مع التركيز على أسبابه، وبانياته، وميزاته السريرية، وطرق التشخيص، واستراتيجيات العلاج.

**الطرق:** يقوم هذا المقال بتجميع الأبحاث الحالية حول التهاب الملتحمة البكتيري، مع الاستفادة من مجموعة من المصادر لتقديم رؤى شاملة حول انتقاله، وعوامل الإصابة، والمنهج السريري للتشخيص والعلاج. كما تستعرض المراجعة مسببات الأمراض البكتيرية، وأدوات التشخيص، وأنماط مقاومة المضادات الحيوية.

**النتائج:** عادة ما يكون التهاب الملتحمة البكتيري ناتجًا عن بكتيريا الهيموفيلوس الإنفلونزا، والمكورات الرئوية، والمكورات العنقودية الذهبية. وفي الأطفال، يرتبط عادةً بالتهاب الأذن الوسطى، بينما قد يعاني البالغون من حالات أكثر تكرارًا من المكورات العنقودية الذهبية. يتم تشخيص الحالة من خلال العرض السريري، مع الاعتماد في بعض الأحيان على الزرع واختبارات PCR للحالات المعقدة. العلاج بالمضادات الحيوية، وخاصة العوامل الموضعية، فعال في معظم الحالات، على الرغم من أن الإفراط في الاستخدام لا يزال مصدر قلق. غالبًا ما يتم وصف العلاج التجريبي بالمضادات الحيوية على الرغم من انخفاض معدل العدوى البكتيرية في حالات الأطفال.

**الخلاصة:** يعد التهاب الملتحمة البكتيري حالة شائعة يمكن علاجها ولها تشخيص عام جيد. ومع ذلك، فإن التشخيص الخاطئ والاستخدام غير الضروري للمضادات الحيوية يسهم في المشكلة المتزايدة لمقاومة المضادات الحيوية. يجب على الأطباء اعتماد طرق تشخيصية لتقليل الوصفات غير الضرورية وتعزيز فعالية العلاج.

**الكلمات المفتاحية:** التهاب الملتحمة البكتيري، مقاومة المضادات الحيوية، التشخيص، العلاج، المكورات العنقودية الذهبية، الهيموفيلوس الإنفلونزا، البانيات، الفسيولوجيا المرضية، الصحة العامة