

## Streptococcal Pharyngitis in a Two-Month-Old Infant: A Case Report

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### Abstract

**Introduction:** Group A  $\beta$ -hemolytic *Streptococcus* is the most common cause of bacterial pharyngitis among 5 - 15-year-old children, but it is uncommon in children less than three years old and rarely happens in infants less than one year old.

**Case Presentation:** The patient was a 62-day-old female infant who presented with fever and poor feeding since two days before admission. At the time of admission, the patient was febrile and ill. Upon examination, a rectal temperature of 38.5°C, multiple right-sided submandibular lymphadenopathies, pharyngeal erythema, and tonsillar exudates were detected. Twenty-four hours after the throat swab was collected and cultured, *Streptococcus pyogenes* grew on a sheep blood agar medium. The patient's mother, who also experienced similar symptoms, had a positive throat swab culture for *S. pyogenes*.

**Conclusions:** Although *Streptococcal pharyngitis* is rare in children less than three years old and the necessity of treatment is not well clarified, in case of streptococcal infection in parents and the occurrence of similar signs and symptoms in their child, considering *S. pharyngitis* as a possible differential diagnosis seems rational.

**Keywords:** Infant, pharyngitis, *Streptococcus pyogenes*

### 1. Introduction

Acute pharyngitis is one of the most common outpatient complaints, accounting for 1.3% of all outpatient visits in the United States and resulting in more than 15 million outpatient visits annually (1). The causes of acute pharyngitis can include both infectious and noninfectious agents. Viruses are responsible for most cases of infectious pharyngitis (2). Group A  $\beta$ -hemolytic *Streptococcus* (GABHS) is the most common and the most important cause of bacterial pharyngitis in pediatric patients, accounting for 10% - 30% of sore throats in children and 5% - 10% of sore throats in adults (3, 4).

The highest prevalence of GABHS pharyngitis is seen in children aged 5 - 15 years who live in temperate climates. The peak of incidence occurs in children more than five years old during winter and spring (5, 6). Sudden onset sore throat, dysphagia, and fever are the most common symptoms of GABHS pharyngitis, and they may be accompanied by headache, nausea, vomiting, and abdominal pain. Pharyngotonsillitis, patchy exudates of the pharynx, palatine petechial, and anterior cervical adenitis are other signs and symptoms of GABHS pharyngitis (5, 6).

Due to the considerable overlap in symptoms and signs of streptococcal and nonstreptococcal pharyngitis,

it is not often possible to diagnose the conditions clinically. A definitive diagnosis requires laboratory tests such as a throat swab culture on a sheep blood agar plate and the rapid antigen detection test (RADT) (6, 7). Apart from acute infectious complications, GABHS pharyngitis can cause noninfectious complications such as acute rheumatic fever, rheumatic heart disease, and acute post-streptococcal glomerulonephritis (8).

Although children will recover from GABHS pharyngitis without treatment, pharmacologic therapy is recommended. The timely diagnosis and treatment of GABHS tonsillopharyngitis reduces the risk of infection transmission, the duration of the disease, and the number of school absences. Moreover, proper treatment prevents noninfectious complications, such as rheumatic fever (5, 9, 10). Laboratory assessment and diagnostic procedures are not usually necessary in children under three years old, since GABHS pharyngitis is not prevalent among this age group, and the classic clinical complications do not manifest in these children (6). Here, we report a case *Streptococcal pharyngitis* in a 62-day-old infant.

## 2. Case Presentation

The patient was a 62-day-old female infant who was referred to our hospital's pediatric outpatient clinic with the complaint of fever and poor feeding since two days beforehand. Since the appearance of fever, she had been prescribed Acetaminophen drops, but her symptoms persisted until admission. During this period, the patient had no sneezing or coughing. The patient's 28-year-old mother had given birth to the patient through normal vaginal delivery (NVD) after a term pregnancy, and the patient's birth weight had been 3200 grams. The patient had been fully immunized, except for the vaccination administered at an age of two months old. The mother's whole pregnancy had elapsed without any specific problem. From her birth until the day she was admitted, the patient had not experienced any health issues.

During physical examination, the infant appeared ill but not toxic. Rectal temperature, heartbeat, and respiratory rate were recorded as 38.8, 123, and 42, respectively. No lesions were observed during a physical examination of the patient's skin. No conjunctivitis, lacrimation, or rhinorrhea was discerned during a head examination. The otoscopic exam was normal bilaterally. The examination of the patient's oral cavity and pharynx revealed a mild erythema with abundant dark exudates on pharynx and right tonsils. The soft palate appeared normal and no petechia was found. Multiple right-sided submandibular lymphadenopathies with 1 × 1-centimeter size were found during an examination of the patient's neck. The physical examination was not significant otherwise.

The infant's mother mentioned that she herself had been suffering from sore throat and fever. She complained of malaise and denied having rhinorrhea, sneezing, and coughing. The mother's vital signs were a blood pressure of 120/80, a heart rate of 79 bpm, a respiratory rate of 14 per minute, and an oral temperature of 38.5°C. She had no tegumentary lesions and her eyes, ears, and nose examinations were normal. The pharynx and uvula were erythematous, and the posterior pharynx and the pharyngeal tonsils were covered with exudates. The rest of the mother's physical exam was normal.

Considering the patient's clinical findings, paraclinical examinations were requested. The complete blood count results showed 16,000 WBC (neut: 70%, lymph: 20%, eos: 5%, mixed: 5%), with a blood sedimentation rate (ESR) of 24 mm/hour, and C-reactive protein (CRP) was negative. Throat swabs were obtained from the mother and the infant, and the collected samples were cultured in sheep blood agar plates (HiMedia, India). After a 24-hour incubation period, immobile, catalase-negative, oxidase-negative, Gram-positive cocci colonies grew in chains. The

cocci were positive in the pyrrolidonyl arylamidase (PYR) test and showed complete hemolysis, which represents *Streptococcus pyogenes*.

Since she showed no improvement during this period, the patient was given 200,000 units of penicillin, which were injected intramuscularly. The mother was also treated with a single dose of intramuscular penicillin benzathine G, at a dose of 1,200,000 units. The next day, our patient's fever disappeared, and the clinical symptoms of the mother improved after penicillin administration. One week later, a second culture of the throats of the mother and the infant came back negative for *Streptococcus pyogenes*.

## 3. Discussion

*Streptococcus pyogenes* is the most common cause of bacterial pharyngitis among children (6). The prevalence of this type of pharyngitis varies among different age groups. It is most commonly seen in school-age children (7). In a meta-analysis conducted on the prevalence of *Streptococcus pyogenes*, its prevalence among all age groups was reported as 3% - 26% (pooled prevalence = 12, CI 95% = 9% - 14%) (4). The prevalence of GABHS pharyngitis in children under 5 years old was reported between 2% - 17% (pooled prevalence = 4%, CI 95% = 1% - 7%), which is significantly lower than other studied age groups (11). It is much less common among children under 3 years old. In a study, the rate of infection of GABHS pharyngitis among 3 - 23-month-old infants who were admitted with the chief complaint of pharyngitis was five percent (12).

There are only a few previously published articles about *S. pharyngitis* in children under one year old. Since 1966, there have been 39 reported cases of systemic diseases following GABHS infection among infants and neonates, a few of which have been pharyngitis (13). Only one article published in 1952 reported the incidence of an epidemic of neonatal pharyngitis due to GABHS pharyngitis. Out of a total of 36 cases of streptococcal infection in the hospital, four were pharyngitis. The infants were hospitalized in a ward that was beside a ward with children with streptococcal infections and rheumatic fever (14).

Steinkuller et al. (15) reported cases of three 8 - 12-month-old infants who were infected with GABHS pharyngitis. The first patient was a 12-month-old infant who was admitted to the emergency department due to acute respiratory distress. An examination showed significant enlargement of the tonsils, which were covered with white and thick exudates. Rapid tests were positive. The second patient was a 10-month-old infant who was admitted with 40.6°C fever and repeated vomiting. An examination showed enlargement of the tonsils, which had severe

white exudates on them. A rapid test confirmed the GABHS pharyngitis infection. The third was an 8-month-old infant with fever of 40.5°C and clinical conditions similar to the other two cases. It turned out that all three infants were fed with food prechewed by their parents, who had either apparent pharyngitis or throat positive culture in two out of three cases.

Del Castillo et al. (16) reported an 8-week-old African-American infant complaining of a rash associated with coughing and nasal discharge for three days without any obvious infectious source. The infant's throat examination showed an erythema without exudates. The patient's throat culture for GABHS was positive, however. The infant's mother was infected with GABHS pharyngitis three days before the onset of the infant's symptoms. The infant received a 10-day treatment regimen with amoxicillin. According to these reports, most children less than one year old who were infected with GABHS pharyngitis had a history of close contact with adult patients who had recently had pharyngitis. Close contact with a family member suffering from diseases caused by GABHS had previously been reported as a source of other neonatal infections, such as meningitis (13).

Although one report did not mention the presence or absence of fever (14) and one case had no fever, (16) fever was a major finding in the infected infants in other cases, (15) similar to our patient. Our infant patient had severe exudates in her tonsils. Exudates were reported to be found in all three cases presented by Steinkuller et al. (15). The most important objective when treating GABHS pharyngitis is the prevention of rheumatic fever, which is very uncommon among children under three years old (17, 18). Although we treated our patient because she appeared ill and had poor feeding, the necessity of treating children under three years old is controversial. If treatment is needed, the drug of choice and the appropriate dosage is unclear. While treating GABHS pharyngitis with penicillin benzathine G (as the antibiotic of choice), a weight of 27 kilograms has been considered to be the only decision-making criterion to find the administration dose (6). Whether this criterion applies to children under three years old, especially those less than one year old, is unclear.

### 3.1. Conclusion

Although GABHS pharyngitis seems to be rare in children less than one year old, especially neonates, according to present evidence, this infection can be associated with significant infectious and noninfectious complications. Paying more attention to infants' clinical findings and accurate laboratory diagnostic tests may lead to the diagnosis of more cases of GABHS pharyngitis in newborns and infants.

Since the majority of infants with a GABHS infection had a history of close contact with an infected person, proper and timely treatment of those in contact with newborns and infants is recommended to prevent the transmission of the disease to children. Current clinical practice guidelines for the management of GABHS do not determine the drug of choice, the dose, and duration of treatment for children less than one year old. Taking this age group into account when developing guidelines and treatment protocols is necessary.

### Footnotes

**Authors' Contribution:** Mohammad Reza Sharif contributed to the conception and design of the work; Marzieh Aalinezhad contributed substantially to the conception or design of the work, drafting the work, and critically revising the work for important intellectual content; Seyyed Mohammad Sajad Sajadian contributed to the drafting of the work and critically revising the work for important intellectual content; Mostafa Haji Rezaei contributed to the drafting of the work and critically revising the work for important intellectual content and final approval of the version to be published.

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### References

1. Ruppert SD, Fay VP. Pharyngitis: soothing the sore throat. *Nurse Pract.* 2015;**40**(7):18-25. doi: [10.1097/01.NPR.0000466498.57296.60](https://doi.org/10.1097/01.NPR.0000466498.57296.60).
2. Weber R. Pharyngitis. *Prim Care.* 2014;**41**(1):91-8. doi: [10.1016/j.pop.2013.10.010](https://doi.org/10.1016/j.pop.2013.10.010). [PubMed: [24439883](https://pubmed.ncbi.nlm.nih.gov/24439883/)].
3. Ba-Saddik IA, Munibari AA, Alhilali AM, Ismail SM, Murshed FM, Coulter JB, et al. Prevalence of Group A beta-haemolytic Streptococcus isolated from children with acute pharyngotonsillitis in Aden, Yemen. *Trop Med Int Health.* 2014;**19**(4):431-9. doi: [10.1111/tmi.12264](https://doi.org/10.1111/tmi.12264). [PubMed: [24405659](https://pubmed.ncbi.nlm.nih.gov/24405659/)].
4. Shaikh N, Leonard E, Martin JM. Prevalence of streptococcal pharyngitis and streptococcal carriage in children: a meta-analysis. *Pediatrics.* 2010;**126**(3):e557-64. doi: [10.1542/peds.2009-2648](https://doi.org/10.1542/peds.2009-2648). [PubMed: [20696723](https://pubmed.ncbi.nlm.nih.gov/20696723/)].
5. Borchardt RA. Diagnosis and management of group A beta-hemolytic streptococcal pharyngitis. *JAAPA.* 2013;**26**(9):53-4. [PubMed: [24069674](https://pubmed.ncbi.nlm.nih.gov/24069674/)].
6. Shulman ST, Bisno AL, Clegg HW, Gerber MA, Kaplan EL, Lee G, et al. Clinical Practice Guideline for the Diagnosis and Management of Group A Streptococcal Pharyngitis: 2012 Update by the Infectious Diseases Society of America. *Clinical Inf Dis.* 2012;**55**(10):e86-e102. doi: [10.1093/cid/cis629](https://doi.org/10.1093/cid/cis629).
7. Kim S. Optimal Diagnosis and Treatment of Group A Streptococcal Pharyngitis. *Infect Chemother.* 2015;**47**(3):202-4. doi: [10.3947/ic.2015.47.3.202](https://doi.org/10.3947/ic.2015.47.3.202). [PubMed: [26483997](https://pubmed.ncbi.nlm.nih.gov/26483997/)].
8. Ralph AP, Carapetis JR. Group A streptococcal diseases and their global burden. *Curr Top Microbiol Immunol.* 2013;**368**:1-27. doi: [10.1007/82\\_2012\\_280](https://doi.org/10.1007/82_2012_280). [PubMed: [23242849](https://pubmed.ncbi.nlm.nih.gov/23242849/)].

9. Shetty A, Mills C, Eggleton K. Primary care management of group A streptococcal pharyngitis in Northland. *J Prim Health Care*. 2014;**6**(3):189–94. [PubMed: [25194245](#)].
10. Van Brusselen D, Vlieghe E, Schelstraete P, De Meulder F, Vandeputte C, Garmyn K, et al. Streptococcal pharyngitis in children: to treat or not to treat?. *Eur J Pediatr*. 2014;**173**(10):1275–83. doi: [10.1007/s00431-014-2395-2](#). [PubMed: [25113742](#)].
11. Carapetis JR, Steer AC, Mulholland EK, Weber M. The global burden of group A streptococcal diseases. *Lancet Inf Dis*. 2005;**5**(11):685–94. doi: [10.1016/s1473-3099\(05\)70267-x](#).
12. Woods WA, Carter CT, Schlager TA. Detection of group A streptococci in children under 3 years of age with pharyngitis. *Pediatr Emerg Care*. 1999;**15**(5):338–40. [PubMed: [10532665](#)].
13. Lardhi AA. Neonatal group A streptococcal meningitis: a case report and review of the literature. *Cases J*. 2008;**1**(1):108. doi: [10.1186/1757-1626-1-108](#). [PubMed: [18710558](#)].
14. Langewisch WH. An epidemic of group A. type 1 streptococcal infections in newborn infants. *Pediatrics*. 1956;**18**(3):438–47. [PubMed: [13359062](#)].
15. Steinkuller JS, Chan K, Rinehouse SE. Prechewing of food by adults and streptococcal pharyngitis in infants. *Pediatr J*. 1992;**120**(4):563–4.
16. Del Castillo LD, Macaset T, Olsen J. Group a streptococcal pharyngitis and scarlatiniform rash in an 8-week-old infant. *Am J Emerg Med*. 2000;**18**(2):233–4. doi: [10.1016/s0735-6757\(00\)90032-9](#).
17. Tani LY, Veasy LG, Minich LL, Shaddy RE. Rheumatic fever in children younger than 5 years: is the presentation different?. *Pediatrics*. 2003;**112**(5):1065–8. [PubMed: [14595047](#)].
18. Orun UA, Ceylan O, Bilici M, Karademir S, Ocal B, Senocak F, et al. Acute rheumatic fever in the Central Anatolia Region of Turkey: a 30-year experience in a single center. *Eur J Pediatr*. 2012;**171**(2):361–8. doi: [10.1007/s00431-011-1555-x](#). [PubMed: [21866339](#)].