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Case Report

# Invasive Disease with Bacteremia, Lymphangitis, and Polyarthritis due to *Streptococcus pyogenes*. Clinical Case

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## Abstract

Multicenter studies between 2011-2018 warned of an increase in invasive infections by *Streptococcus pyogenes* in several countries. In December 2022 there was a new health alert in the United Kingdom.

*Streptococcus pyogenes* is a gram-positive bacterium and the surface M protein is responsible for its virulence. It causes mostly pharyngotonsillar infections, lymphangitis, cellulitis, abscesses but also arthritis, osteomyelitis, complicated pneumonia, necrotizing fasciitis and sepsis among others.

We present the case of a 12-year-old patient who was admitted due to fever that was difficult to control, lymphangitis and polyarthritis. The joint fluid result suggested septic arthritis. Subsequently, blood culture and PCR were received in joint fluid positive for *Streptococcus pyogenes*.

***Keywords:*** *Polyarthritis; Bacteriemia; Streptococcus pyogenes*

## Introduction

*Streptococcus pyogenes* is a gram-positive aerobic bacterium responsible for a wide variety of infections, mainly pharyngotonsillitis, lymphangitis, cellulitis, abscesses but also arthritis, osteomyelitis, complicated pneumonias, necrotizing fasciitis and sepsis. Different multicenter studies in Spain, France and Great Britain [3] have warned of an increase in invasive diseases by *S. pyogenes*, with the majority serotypes M1 and M3 [2].

## Reporting a Case

A 12-year-old basketball player was admitted due to fever up to 38.5ºC after 24h of evolution, difficult to control with antipyretics, associated with edema and erythema of the back of the left hand with lymphangitis cord up to the elbow. He presented as a history two days prior to his admission, gonalgia of right predominance with severe functional impotence in the context of a tournament, without apparent inflammatory signs and which was attributed to bilateral patellar tendinitis.

In admission analysis, leukocytosis of 14000 with predominance of neutrophils 84% and PCR 125 mgr/l. With diagnostic guidance of cellulitis of the left hand associated with polyarthritis, treatment with intravenous amoxicillin-clavulanic acid was initiated.

No history of intestinal infection or personal or family rheumatologic history.

Due to suspicion of infectious versus rheumatologic process, we proceed to study with pharyngeal culture for SGA, rheumatoid factor, HLAB27, serologies (*Borrelia, Bartonella, Chlamydia, Mycoplasma*) that are negative. Also, ophthalmological study that rules out uveitis and echocardiogram that is normal.

It presents limitation of fever in 24 hours and improvement of the inflammatory process in hand. However, there is an increase in inflammatory signs in the left knee and right ankle, with slight effusion according to ultrasound control, so knee arthrocentesis is decided. Sero-purulent fluid with frankly inflammatory characteristics was obtained by presenting leukocytes of 22,400 with 84% neutrophils, glucose 83 mg/dl and proteins 40.3 mgr/dl, negative culture and PCR that is pending.

### Classification according to the characteristics of the synovial fluid

| | Non inflammatory | Inflammatory | Septic | Hemorrhagic |
|---|---|---|---|---|
| leuc/mcliter | < 2000 | 2000 - 20000 | > 20000 | >1leu/every 1000hties |
| % neutrophils | < 25% | 50-75% | > 75% | <50% |
| Crystals | Negative | Acuric Crystals or CPPD | Negative | Hemorrhagic |
| Cuture | Negative | Negative | It can be positive (depends on the organism or previous exposure to AB) | Negative |

***Table:*** *Source: UpToDate.*

At 24 hours they report positive blood culture for *Streptococcus pyogenes* multisensitive.

Torpid evolution follows with onset of pain in sacroiliac joints (normal MRI) and persistent swelling in the knee, so intravenous corticosteroid is added. After 10 days, a new arthrocentesis due to persistence of phlogistic signs in the knee confirms good evolution (negative culture) and MRI describes mild osteomyelitis in the knee.

Positive PCR to *Streptococcus pyogenes* was received in joint fluid confirming diagnosis of invasive GAS infection with bacteremia and polyarticular infection.

Complete 14 days of parenteral treatment and up to 3 weeks oral per component of osteomyelitis.

## Discussion and Conclusion

*Streptococcus pyogenes* is a gram-positive coccus aerobic bacterium that commonly causes acute pharyngitis and other skin infections in children. In recent years, there has been an increase in invasive group A streptococcal (GAS) infections worldwide defined by bacteremia, pneumonia, osteomyelitis, septic arthritis, necrotizing fasciitis and myositis, causing significant morbidity and mortality.

In children, bacteremia or sepsis due to GAS is estimated at 1 - 3 cases per 100,000 each year and 3 - 5 per 100,000/year in children under 1 year of age [1].

The serotypes that are more virulent are those determined by the protein M1 and M3, in addition to producers of exotoxin DNAs a encoded by the spe gene [1].

Multicenter studies in 2007 in France, identified an increase in the incidence of iGAS cases from 1 to 3.1 per 100,000 inhabitants with an increase in lethality up to 14% (streptococcal toxic shock syndrome. Bacteremia without focus identified (22%) and skin/soft tissue infections (30%) were the most frequent clinical presentations [3,4].

In Spain, a study determined an increase of up to 4 times the incidence of *Streptococcus pyogenes* infection between 2011 and 2017 [5].

In December 2022, there was a health alert in the United Kingdom due to an increase in iGAS specifically in children compared to pre-pandemic figures that represents an increase from 0.5 to 2.3 per 100,000 inhabitants in children under 10 years of age and with special incidence in children under 4 years of age. The creation of national data collection networks such as Pedgas-net should make it possible to estimate the incidence in Spain.

Differential diagnosis should be made with juvenile idiopathic arthritis since a form of onset is joint superinfection in adolescent patients [5]. Differential diagnosis with poststreptococcal reactive arthritis is also a challenge since the biochemistry of synovial fluid in the early phase is not always conclusive and CRP may not be available to all centers [6,7].

Rheumatic fever, an autoimmune inflammatory process, should be considered in the differential diagnosis of arthritis in its debut with superinfection. It predominantly affects large joints and in any case, germ will not be isolated in joint fluid [5].

## Bibliography

1. UpToDate [Internet]. Uptodate.com. (2023).
2. González-Abad MJ and Alonso Sanz M. "Infecciones invasoras por *Streptococcus pyogenes* (2011-2018): serotipos y presentación clínica". *Anales de Pediatría* 92.6 (2020): 351-358.
3. Lepoutre A., *et al*. "Epidemiology of invasive *Streptococcus pyogenes* infections in France in 2007". *Journal of Clinical Microbiology* 49.12 (2011): 4094-4100.
4. Canada.ca. (2023).
5. Pediatría integral - Órgano de expresión de la Sociedad Española de Pediatría Ex-trahospitalaria y Atención Primaria (SEPEAP) [Internet]. *Pediatría Integral* (2022).
6. Santos Hernández JE., *et al*. "Fiebre reumática aguda y artritis séptica por Streptococcus pyogenes simultáneas en un preescolar". Medigraphic.com. (2023).
7. Sánchez CA., *et al*. "Poliartritis séptica y fascitis necrotizante en un paciente inmunocompetente. Reporte de caso". *Revista Colombiana de Ortopedia y Traumatología* 35.2 (2021):198-203.

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