# Hospital care and medical costs of septic arthritis in Spain:

## A retrospective multicenter analysis

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## Background

Septic arthritis is an uncommon cause of joint swelling and monoarticular arthritis [1]. These infections remain a challenge in terms of diagnosis and management, especially in children, considering that they can lead to long-lasting sequelae; when inadequately treated, septic arthritis can cause irreversible joint damage and disability [2,3].

Few data is available concerning the burden of septic arthritis in Spain, although management guidelines adjust to global strategies [4].

**The objectives of this study were to review the characteristics of patients admitted with septic arthritis in Spanish hospitals and to measure the associated direct medical costs.**

## Methods

Records of hospital admissions of patients with septic arthritis as a primary diagnosis registered between 2010 and 2019 were evaluated in a retrospective study.

Patients with septic arthritis were identified by the primary diagnosis code.

Mortality rate was calculated within hospital settings as the annual number of deaths within all patients registered in the National discharge database with a case of septic arthritis.

Direct medical costs were calculated based on mean costs of medical procedures determined by the Ministry of Health including examination, medication or surgery, nutrition and other resources.

## Results

### Patient characteristics

Files from 16,438 patients were evaluated; median age was 56 years and 62.8% of patients were males.

The knee was the most commonly involved joint, registered in 49% of the cases.

The most frequently registered pathogen was *Staphylococcus*, and 2.7% of admissions registered an antibiotic resistant infection (Table 1).

**Table 1. Summary of patient characteristics.**

| | Pediatric patients | Adult patients |
|---|---|---|
| **Admissions, N** | 3,954 | 13,583 |
| **Patients, N** | 3,835 | 12,603 |
| **Median age, years (95%CI)** | 2 (2-2) | 65 (64-65) * |
| **Males, %** | 58.8 | 64.0 * |
| ***Staphylococcus* infection, %** | 10.0 | 21.3 * |
| ***Streptococcus* infection, %** | 3.7 | 7.0 * |
| **Antibiotic resistance, %** | 1.0 | 3.3 * |

CI: Confidence interval. * p-value pediatric versus adult population <0.05.

The most frequent secondary conditions diagnosed during the admission were hypercholesterolemia, diabetes mellitus, essential hypertension, anemia and cardiac dysrhythmias, found in significantly higher frequencies in adult patients.

Hospital mortality rate was 2.8%, median age of deceased patients was 81 years (95%CI 79-82). No deaths were registered in pediatric patients over the study period.

### Use of healthcare resources

Most of the admissions were urgent and median hospitalization time was 14 days for adult patients and 8 days for children (Table 2).

An intensive care unit (ICU) stay was registered in 4.5% of hospital admissions, with a median length of ICU stay of 3 days.

The most frequent medical procedures registered during the admission were the injection of antibiotics, diagnostic ultrasounds, arthrocentesis and other exploratory and surgical interventions.

**Table 2. Admission details, surgical and medical procedures (>15% of admissions).**

| | Pediatric patients | Adult patients |
|---|---|---|
| **Urgent admissions, %** | 96.4 | 87.7 * |
| **Median length of stay, days (95%CI)** | 8 (8-8) | 14 (14-14) * |
| **ICU admissions, %** | 6.0 | 4.1 * |
| **Median length of ICU stay, days (95%CI)** | 1 (1-2) | 4 (3-5) |
| **Registered procedures, %** | - | - |
| Infusion of anti-infective substances | 59.9 | 45.3 * |
| Diagnostic ultrasound | 44.2 | 32.0 * |
| Arthrocentesis | 37.3 | 30.5 * |
| Microscopic examination of specimen | 23.0 | 21.3 * |
| Local excision/destruction of joint lesion | 5.5 | 23.5 * |
| X-ray | 16.5 | 19.3 * |
| Microscopic examination of blood | 25.7 | 13.9 * |
| Arthroscopy | 3.9 | 18.1 * |
| Arthrotomy | 18.7 | 13.0 * |
| Synovectomy | 3.3 | 16.6 * |
| CT scan | 1.6 | 16.5 * |

ICU: Intensive care unit; CI: Confidence interval; CT: Computerized tomography. * p-value pediatric versus adult population <0.05.

### Direct medical cost

- Median admission cost was €6382 per patient, with no significant differences between age groups (Table 3).
- Admission cost increased significantly with length of hospital stay.
- Admissions in which an arthrotomy was registered had a significantly lower cost than those without an arthrotomy in all age groups.
- The total annual medical cost was €12.7 million.

**Table 3. Annual direct medical costs in hospital settings. Costs in €2019 (95%CI).**

| Median admission cost | Pediatric patients | Adult patients |
|---|---|---|
| **Total** | 6382 (6335-6382) | 6382 (6382-3682) |
| **Admissions <12 days** | 6382 (6335-6382) | 6335 (6335-6337) |
| **Admissions >12 days** | 6335 (6334-6382) | 6748 (6748-6861) |
| **Admissions for *staphylococcus*** | 6382 (6335-6748) | 6748 (6382-6748) |
| **Admissions for *streptococcus*** | 6954 (6748-7273) | 6862 (6748-6954) |
| **Admissions for other pathogen** | 6335 (6335-6382) | 6382 (6335-6382) |
| **Admissions with arthrotomy** | 5807 (5015-5818) | 5445 (5221-5616) |
| **Admissions without arthrotomy** | 6382 (6382-6382) | 6382 (6382-6748) |

CI: Confidence interval. * p-value pediatric versus adult population <0.05.

## Conclusions

This study provides new data on the medical costs of septic arthritis in Spain, providing a basis for the revision of resource allocation decisions in order to reduce the burden of this condition at the healthcare system level. Further research will be required to quantify the total burden associated to this condition.

**REFERENCES**

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