

Impact of antibiotic pre-treatment on cultures in children with osteomyelitis and septic arthritis: a retrospective review

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Background : In the management of pediatric osteomyelitis or septic arthritis, delay in treatment may affect outcome, while receipt of antibiotics prior to culture may affect culture results.

Objective: We aimed to determine if pathogen identification decreased in cultures that were pre-treated with antibiotics.

Methods: We conducted a retrospective cohort study of 584 hospitalized children between 30 days and 18 years of age admitted to two tertiary children's hospitals. Logistic regression assessed the effect of antibiotic duration on blood, bone, joint aspirate and "other" culture positivity.

ACADEMIC P.E.A.R.L.S

Pediatric Evidence And Research Learning Snippet



Impact of empirical antibiotics on cultures in children with osteomyelitis and septic arthritis

Results: Overall, 42% of blood cultures, 70% of bone cultures, 39% of joint cultures, and 70% of "other" cultures were positive. Compared with children who did not receive antibiotics prior to culture, there were no significant differences in odds of a positive culture in children whose cultures were pre-treated with antibiotics for any of the culture types [OR (95% CI) 0.90 (0.56–1.44) for blood cultures, 0.77 (0.25–2.34) for bone cultures, 0.71 (0.39–1.28) for joint cultures, 1.18 (0.58–2.41) "for other" cultures; all $p > 0.05$]. Furthermore, the duration (hours) of antibiotics in the pre-treated cultures was also not a significant predictor of culture positivity (OR ranged from 0.99–1.00 for all cultures, $p > 0.05$).

Conclusions: Culture positivity was not associated with antibiotic pre-treatment in any of the samples, even for longer duration of antibiotics prior to culture, though the small sample size of subgroups is an important limitation. **In pediatric patients hospitalized with osteomyelitis and/or septic arthritis, early initiation of antibiotics may not affect culture positivity.**

Key message: To our knowledge, this is the largest study to date examining the effect and timing of antibiotics on culture results in this population. Pre-treatment of patients with antibiotics prior to cultures was not associated with significant change in culture yield, even as the duration of antibiotics increased.

EXPERT COMMENT

"Prompt diagnosis and treatment of septic arthritis & osteomyelitis in children is critical to prevent long term complications like joint destruction, growth failure or sepsis. The study gives an important message as to not delay antibiotic treatment (major risk factor for poor prognosis). Prospective studies or trials are needed to determine if early initiation of antibiotics affects culture positivity."

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With warm regards,

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Reference

1. Lansell, A., Vasili, Y., Suchdev, P.S. *et al.* Impact of antibiotic pretreatment on cultures in children with osteomyelitis and septic arthritis: a retrospective review. *BMC Pediatr* **21**, 342 (2021). <https://doi.org/10.1186/s12887-021-02806-w>
2. Zhorne DJ, Altobelli ME, Cruz AT. Impact of antibiotic pretreatment on bone biopsy yield for children with acute hematogenous osteomyelitis. *Hosp Pediatr*. 2015; 5(6): 337–41. <https://doi.org/10.1542/hpeds.2014-0114>.