The Role of Surgery in the Management of Acute Hematogenous Osteomyelitis : Effect of Antibiotic Timing on Culture Yield in Children

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INTRODUCTION:
Acute hematogenous osteomyelitis (AHO) is a invasive infection in children with the potential for substantial morbidity including the development of chronic infection, growth arrest, sepsis and pathologic fracture. Drainage of septic material in bones provides specimens for culture as well as therapeutic benefit. Purpose of this study is to analyze the influence of antibiotic timing on surgical culture yield in children with AHO.
METHODS: A retrospective review of cases of AHO aged less than 18 years was performed from 2010 to 2019. A total of 60 cases met inclusion criteria. All patients had both blood and “other” culture samples. “Other” cultures were cultures from wound, abscess, soft tissue, bone or joint fluid collected from operative site for culture. Patients with malignant disease, underlying bone disease, osteomyelitis caused by mycobacterium or fungus, orthopedic hardware, puncture wounds, and septic arthritis without adjacent osteomyelitis on imaging were excluded.
RESULTS: 34 patients in the pre-treatment group and 26 patients in the post-treatment group. Overall, 26.7% of blood cultures (rate of positive blood cultures, 23.1% (pre-treatment) *versus* 29.4% (post-treatment); $p = 0.58$) and 63.3% of “other” cultures (rate of positive “other” cultures, 73.1% (pre-treatment) *versus* 55.9% (post-treatment); $p = 0.17$) 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.
DISCUSSION AND CONCLUSION:
Appropriate antimicrobial therapy is essential for good clinical outcome and minimization of long-term complications. Wound, abscess, soft tissue, bone or joint fluid samples cultures have a higher diagnostic yield compared to blood cultures. Pre-treatment of patients with antibiotics prior to culture was not associated with a significant change in culture yield. In children with AHO, antibiotic administration before surgery does not decrease surgical culture yield. Our results suggest that children presenting with suspected AHO should receive appropriate systemic antibiotics promptly after blood cultures are obtained.